

RESILIENCE In The Workplace

An Evidence Review and
Implications for Practice



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FOREWORD

For decades, the American Heart Association (AHA) has been an important resource for companies that want credible health programs and services for their employees. We know the best programs are based in science and can show evidence of their impact. The AHA CEO Roundtable has served as an important leadership collaborative with our 30-plus member CEOs who represent some of the nation's largest employers.

More and more, as many employers have learned, stress is a significant risk in the workplace. And resiliency, how employees cope with and bounce back from difficult situations, has become increasingly important to improve employee health and well-being, and increase organizational productivity. That's why the AHA Center for Workplace Health Research and Evaluation developed this report, based on peer-reviewed evidence that examined programs focused on employee resiliency.

The need for this research is evident. In 2016, the American Heart Association and our CEO Roundtable commissioned a study from Nielsen that found 40 percent of employees reported their job gets in the way of their health. Stress levels were found to be high and unrelenting; more than one-quarter of employees in the study said they often or always experience stress because of work. Forty percent of respondents wished their employers would recognize the stress. The World Health Organization names stress as the "health epidemic of the 21st century." These findings and discussions with our CEO Roundtable membership led to our exploration of building a resilient workforce and examining resilience training in the workplace.

In this report, you'll find guidance to employers wishing to implement resilience training programs and workplace policies and practices that could improve the health and well-being of millions of employees across the country. The report includes important employee insights, actionable strategies and case studies. We are delighted to share this resource in hopes of building healthier workplaces – which in turn builds healthier communities all across our country.



A handwritten signature in black ink that reads "Nancy A. Brown".

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EXECUTIVE SUMMARY

The Problem

The U.S. workforce continues to experience a high burden of chronic conditions, including workplace stress and poor mental health. Approximately two in three employees report work as a significant source of stress¹ and depressive illnesses affect one in five U.S. adults.² Routine stress, including job strain and long working hours, may contribute to serious health problems, including elevated risk for heart disease and stroke³ and experiencing depression for the first time.⁴

Annual total expenditures of work-related stress and poor mental health (depression and anxiety) have been estimated at \$190 billion and \$211 billion respectively. Half of that is borne by employers, primarily due to lost productivity, including absenteeism and reduced engagement at work.⁵ Consequently, employers are experimenting with innovative solutions to improve employee health and productivity, and organizational performance. This report explores one of these emerging strategies: resilience.

Definition of Resilience

The AHA CEO Roundtable commissioned this paper to gain a better understanding of the effectiveness of resilience training programs on health, well-being and productivity outcomes. Despite the lack of a consensus definition, resilience can be considered, in general, the ability to withstand, recover and grow in the face of stressors and changing demands.⁶ Overall, different types of resilience training approaches seek to enhance employee resilience by improving their ability to cope with, and recover from, negative work stressors.

Report Scope

The AHA Center for Workplace Health Research & Evaluation evaluated three data sources to shed light on this topic: 1) a synthesis of studies published between 1990 and 2014;^{7-10,11-38} 2) insights from a nationally representative sample of employees on their perceptions of resilience, and its barriers and facilitators in the workplace; and 3) select case studies that document innovative programs employers are using in the field. Since few experimental studies have evaluated systemic approaches that specifically build organizational resilience, this report focuses on individual employee resilience, although we briefly summarize promising emerging system-level approaches.

High Level Findings

Overall, research studies suggest that resilience training programs have a modest effect that is comparable to other primary prevention programs such as mindfulness training³⁹ and depression prevention programs.⁴⁰ This estimated effect is weaker than secondary prevention programs like stress management interventions.⁴¹ These findings are based on a low number of studies conducted in specific occupations with small sample sizes and short-term follow-up. There is some evidence that employees who are assessed as at risk for high stress and poor mental health through health risk assessments may benefit more than those who are not at risk, although this targeted approach could potentially have the unintended consequence of stigmatizing at risk employees.

Personal coaching or group-based programs appear to be more effective than technology-based solutions, although advances in technology-enabled resilience programs are understudied and show promise.¹⁰ Very few studies evaluated the effect of modifiable lifestyle behaviors, such as physical activity and diet on resilience to assess the association between physical health and resilience outcomes. No studies reported costs of interventions, cost effectiveness or systemic, organization-level approaches to building resilience. Finally, little is known at present about the impact of the frequency, intensity and duration of stressors on resilience among employees.⁴² Although program effects appear to be modest, small changes at the individual level could potentially yield broader benefits if realized at the organizational level.

A survey of a nationally representative sample of employed adults indicates that employees value resilience training programs and that they are more likely to participate in these programs when organizational leadership participates. Participation in resilience training programs is associated with positive outcomes with nearly three-quarters of participants (73%) who say their participation has improved their health a great deal or fair amount. Participants also report various specific health outcomes ranging from less negative stress to sleeping better. Case studies by Deloitte, Johnson & Johnson, KKR & Co. L.P. and MeQuilibrium illustrate that organizations are using comprehensive approaches that combine individual programs and system-based approaches to build a culture of resilience in the workplace. Their experiences reveal practical lessons learned, promising practices and creative suggestions for other organizations to consider.


Implications for Practice

Table 1 on page 5 is a summary of suggested practices for designing, implementing and evaluating resilience training programs in the workplace.

Future Directions

Future research is needed to better define resilience, measure it accurately and understand the mechanisms through which resilience leads to health and work performance outcomes. More evidence is also needed to understand which program elements best predict resilience as an outcome. In addition, future research should evaluate the effectiveness of systemic or organizational-level policies and practices, and determine the cost-effectiveness of resilience training programs compared to different types of interventions. As employers design new resilience training programs and organizational practices, or strengthen existing programs and practices, they are encouraged to develop evidence-informed programs, innovate where necessary and publish results. These actions will help close current knowledge gaps between research and practice.

Table 1. Summary of Suggested Practices

 <p>1</p> <p>Understand the Problem</p>	 <p>2</p> <p>Create a Culture Supporting Resilience</p>	 <p>3</p> <p>Assess Resilience and Outcomes at Baseline</p>	 <p>4</p> <p>Determine Program Design</p>	 <p>5</p> <p>Implement & Continuously Improve</p>
STEP 1: Understand the Problem				

- Consider conducting a needs assessment using reliable and valid questionnaires to identify employees who may have low resilience and could benefit from these programs.
- Identify the main contributors of stress, including whether contributing factors vary across sub-populations within your workforce that may indicate different needs.
- Determine if resilience training is a viable solution to build employees' capacity to deal with workplace stressors. For example, it may be a viable solution if the contributing factors can be addressed by helping employees build skills to better manage conflicts, improve poor communication with co-workers and accurately identify the causes of work-related problems.
- Consider the potential unintended consequences of targeting high-risk populations, including negative effects of visibly singling out this sub-population (stigma).
- Determine if primary prevention (designed to reach the entire population), secondary prevention (designed for individuals at risk of depression or anxiety) or tertiary prevention (designed for individuals showing symptoms of depression or anxiety) programs are warranted and operationally feasible.
- Develop a comprehensive approach to prevent or reduce the negative outcomes of stress which can include a resilience training program, but may also include changes in organizational practices and inclusion of complementary workplace health programming. Resilience training may be one of several strategies in a more comprehensive approach to help address negative stress in the workplace.

STEP 2: Create A Workplace Culture that Supports Resilience

- If organizational leadership supports and encourages employees to participate, employees are more likely to participate in resilience training and take advantage of related resources.
- Incorporate organizational practices that support building resilience among the workforce. Examples include: promote opportunities for staff to recover from workplace stress (e.g., use their paid time off, encourage staff to take advantage of workplace health programming, provide employees professional development support).
- Offer and promote resilience training and related resources to all employees including management and senior leadership. Employees are more likely to participate in resilience training programs if their managers, senior leadership and C-suite staff participate.

STEP 3: Assess Resilience and Other Outcomes at Baseline, Post and Follow-up

- Consider measuring resilience at baseline, post-program and ideally at 12-24 months follow-up to assess changes over time.
 - *Use a tool that specifically measures resilience versus related-traits (i.e., level of stress and well-being.) These related traits can also be measured, ideally, using a validated measurement tool.*
- If employers are interested in measuring other secondary outcomes such as mental health and worker productivity, use validated questionnaires that measure these domains.
- Use objective measurements if time and resources allow to measure physical health outcomes, such as physical activity or blood pressure.
 - *AHA recommends using Life's Simple 7[®] metrics to evaluate the effect of resilience on heart health.*
- If a program vendor uses a proprietary tool, request information on the tool's reliability and validity.

STEP 4: Determine Program Design

Theory-Driven Design

- Implement theory-driven programs, meaning they should be based on explicit theoretical models that articulate the causal link between an intervention and its outcomes.
 - *For example, a program informed by cognitive behavioral theory and social support theory may target building skills such as cognitive flexibility and problem-solving and aim to strengthen participants' social support networks.*
- If employers wish to use vendor programs that do not have evidence from the peer-reviewed literature, they should consider requesting a description of the theoretical framework that informs how the program builds and sustains resilience.

Length and Delivery

- Offer flexibility in program delivery. For example, consider making the program available at the workplace during work hours. This may reduce concerns about travel and time off work.
- Weigh program costs when considering delivery format. While the current evidence base suggests that personal coaching and group-based classroom-style learning are more effective, these formats are also more expensive and not always scalable.
- The evidence base for technology-enabled programs is small but growing, and technology can be used to augment other learning formats. If employers wish to use a technology-only solution, consider gathering data about program contact hours and program adoption.
- Consider integrating resilience training into new employee training, with regular follow-up or booster sessions.
- Consider creative technology-based approaches such as video-calling. These technologies may facilitate delivery for follow-up or booster sessions.

(Continued)

Teaching Methods

- Incorporate adult learning principles and vary training methods throughout the program. Minimize the amount of lecture and encourage regular interaction by participants throughout the session.
- Multiple options for delivery are available, including individual, group, classroom, online and mobile. Tailor solutions based on employee preferences obtained by a needs assessment.
- Consider adding a coaching or personal consultation component. From a conservation of resources theory, coaching can help participants handle stressful situations.
 - *Coaching should be designed to be as convenient as possible for participants who are busy managing work, health and in many cases families.*

Topics & Content

- Create a learning environment that allows participants to practice simulated challenges similar to what they might experience in the real world. However, keep in mind that there may be a point when these practices have a negative impact.⁷ For example, exposure to stressful situations in training may be harmful if participants' reactions are not carefully monitored during program delivery.
- Continuous evaluation can help identify negative effects.

STEP 5: Implement, Evaluate & Continuously Improve Program Quality

- Start evaluation planning when program design planning is initiated. Several decisions must be made at the outset to determine the program evaluation methods, which has implications for the conclusions about the effectiveness of a program.
- As a health promotion or prevention strategy, consider integrating resilience training into new employee training with regular follow-up or booster sessions.
- If possible, conduct an economic analysis like a cost-effectiveness assessment.
- Apply insights from program evaluation to improve the quality of the program.



1. BACKGROUND

Strengthening Emotional Fitness

The impetus for this exploratory report was a meeting of the CEOs of the AHA CEO Roundtable in October 2016 where leaders identified the need for building a workplace culture of resilience to help employees manage workplace stressors and reduce the negative health, cost and productivity outcomes associated with poor mental health.

At the October 2016 meeting, Senior Vice President and Health Transformation Team Leader at Aon Hewitt, Stephanie Pronk, presented to members on “emotional fitness,” a term coined to try and reframe mental health programs in a more positive way. Mental health programs offered by Employee Assistance Programs may have low participation partly due to the stigma associated with mental health. Emotional fitness programs may not carry the same stigma and may therefore better engage employees. According to Ms. Pronk, **strengthening emotional fitness** or resilience requires a holistic approach that encompasses all aspects of total well-being, including physical, financial, social and emotional health. This concept resonated with AHA CEO Roundtable members who recognize that the dimensions of health are not separate and distinct units but are interdependent.

When AHA CEO Roundtable members discussed resilience, they generally considered it to be a trait and skill that employees could develop to help them “withstand, recover and grow in the face of stressors and changing demands.”⁶

To strengthen employees’ emotional fitness or resilience, Ms. Pronk shared that many employers today are expanding beyond “traditional” wellness to offer employees happiness programs, mindfulness training, stress management courses and resilience training, which aim to positively influence a broad range of employee outcomes including: improved stress management; increased energy, focus and creativity; and improved quality of life and engagement. In fact, many AHA CEO Roundtable members indicated they were already implementing these types of programs.

Following their meeting, the CEOs commissioned the AHA Center for Workplace Health Research and Evaluation to develop an exploratory report that would:

- Assess the scientific evidence on the effectiveness of workplace resiliency training programs on health, well-being and productivity outcomes
- Recommend evidence-informed practices for employers to implement and evaluate
- Highlight case studies using promising practices and new innovations in program design and delivery

The guidance offered in this paper integrates insights from three data sources:

1. a review of the peer-reviewed published literature from 1990-2014 on the effectiveness of resilience training programs;
2. a national survey of employees’ perceptions of the value of resilience and resilience programs in the workplace; and,
3. select case studies that highlight how employers are implementing resiliency programs on the ground in practice-based settings.

Based on this multi-pronged approach, this report aims to provide initial answers to the following questions:

- Why should employers care about resilience in the workforce?
- How is resilience defined and measured?
- What do we know about the effectiveness of developing, implementing and evaluating resilience training programs?
- How can the current body of evidence be practically applied to improve expected outcomes?
- What do we still need to know? In other words, what gaps are there in research and practice that can strengthen the evidence base?

Given the complexity of this topic, and due to time constraints, it is important to note what is not included in this report. CEOs recognized the importance of utilizing a comprehensive approach, encompassing both individual programs and organizational policies and environmental supports to build resilience in the workplace. Conceptually, a combination of individual and organizational strategies may provide the optimal approach to build and sustain a culture of resilience. For example, for jobs in which stress is a function of extremely aggressive goals, managers who create fearful cultures, poor work flows that require extra effort, and so forth, the most cost-effective actions could be to identify those issues and remediate them to the extent possible. Due to the sparse published literature on systemic or organization-level interventions between 1990 and 2014, this report focuses primarily on the effectiveness of individual resilience training programs.

Notwithstanding these limitations, which can be addressed with a future review of the new evidence, we hope that this report will provide companies with initial insights about resilience training programs and inform them of both its potential benefits, limitations and unintended consequences. For companies wondering if they should incorporate resilience training programs into their health and well-being plans, or for companies that are seeking to improve their current programs, the report may provide helpful suggestions and key considerations for designing, implementing and evaluating resilience training programs. As companies embark on creative and new approaches to holistically and comprehensively improve the health and well-being of their workforce, much opportunity lies ahead. The AHA and CEO Roundtable look forward to further exploring not just resilience, but other means to help people live their healthiest and most productive lives.

Figure 1: Resilience Training Topics



2. WHY SHOULD EMPLOYERS CARE ABOUT RESILIENCE?

Burden of Poor Mental Health & Stress

Depressive illnesses, including major depressive disorder (MDD) and bipolar disorder, affect one in five U.S. adults² and, in 2010, ranked as the second leading cause of disability in the U.S.⁴³ The annual total cost of depression to the U.S. workforce is estimated to be almost \$211 billion, with approximately 50% of these costs being borne by employers.⁵ Most of these workplace costs are due to lost productivity, which includes missing days of work (absenteeism) and reduced productivity at work (presenteeism).⁵

High levels of stress are reported among U.S. workers. In 2015, for example, 65% of U.S. employees reported work as their top stressor¹ and in 2016, an AHA - Nielsen Employee Health Survey found that 28% of employees report that they always, almost always or very often experience stress at work.⁴⁴ Stressful work environments have been found to increase the likelihood of developing depression or anxiety for the first time³⁰ and can lead to negative physical and mental health outcomes⁴⁶ for individuals⁴⁷ and organizations.⁴⁸ Workplace stressors can include long working hours, job strain, high demand, exposure to shift work, job insecurity, limited control, work-family conflict and low social support.⁴⁹⁻⁵¹ Several studies have linked workplace stressors to stress,⁵² diabetes,⁵³ absenteeism,⁵⁴ disability⁵⁵ and turnover.⁵⁶⁻⁵⁷ Workplace stressors have also been implicated in the risk of heart disease,^{58-59,46} with one study finding people who experience high levels of workplace stress have a 10% to 40% higher risk of heart disease compared to people who did not.³ Further, employees who experience high levels of stress are more likely to engage in unhealthy lifestyle behaviors such as alcohol and substance abuse.^{1,60}

Difficult work environments have also been found to contribute to premature death of U.S. workers.⁶¹ A Harvard Business School study examined the excess mortality and incremental health expenditures associated with exposure to ten workplace stressors and found that the largest contributor to premature death was lack of health insurance (49,000).

The biggest factor in healthcare expenditures costs in the U.S. was high demands at work, contributing \$48 billion in spending.⁶¹

Given these sobering statistics and the fact that approximately 151 million working-age adults receive their health insurance from employers,⁶² it is not surprising that employers are looking for comprehensive strategies to meaningfully improve employee health, well-being, productivity, engagement and rising healthcare costs.

Stress and Resilience

Without the resources and capacities to deal with stress, people can experience negative effects in the form of reduced mental health and well-being.^{9,63} Building resilience among individuals and groups may equip them with the capacity to cope with these stressors, including developing protective factors against the negative effects of stress.⁶⁴⁻⁶⁵ Given the magnitude of the prevalence of stress and poor mental health (depression and anxiety) in the U.S. workforce, it is not surprising that many employers have turned to building individual resilience among their workforce to potentially enable employees to develop skills to deal with workplace stress.

In addition to buffering against the negative effects of stress, resilience among employees has been associated with greater job satisfaction, work happiness, organizational commitment and employee engagement.^{66,35} One study indicated that resilience programs may contribute to improved self-esteem, sense of control over life events, sense of purpose in life and interpersonal relations for employees.³⁸

3. WHAT IS RESILIENCE?

Defining Resilience

Currently there is no “gold standard” definition for resilience. In fact, the fields of mental health, emotional well-being, workplace health promotion, industrial and occupational psychology, and human resources management have a variety of definitions for the same concept. With so many definitions, it is not possible to describe all of them or to evaluate the differences in the properties of these definitions.

Figure 2 below illustrates some of the common key concepts from the academic published literature. In general, resilience is understood as the ability to:

- **Deal with challenging events** such as stress, trauma or chronic adversity⁶⁹
- **Bounce back from adversity**, sometimes to a higher level^{17, 70}
- **Thrive in the face of adversity or trauma**, not merely survive through a challenge^{8, 71-72}

Figure 2: A General Definition of Resilience



In this report, we define resilience broadly as the ability to withstand, recover and grow in the face of stressors and changing demands.⁶ Table 2 contains selected definitions that describe the various traits of resilience.⁷⁴

Table 2. Selected Definitions of Resilience

<p>ri-zil-yuh ns resilience resilīre</p>	<p>“Protective factors which modify, ameliorate or alter a person’s response to some environmental hazard that predisposes to a maladaptive outcome.”⁷⁵</p>
	<p>“The process of, capacity for, or outcome of successful adaptation despite challenging or threatening circumstances.”⁷⁶</p>
	<p>“A dynamic process encompassing positive adaptation within the context of significant adversity.”⁷⁷</p>
	<p>“The personal qualities that enables one to thrive in the face of adversity.”⁷⁸</p>
	<p>“The capacity of individuals to cope successfully with significant change, adversity or risk.”⁷⁹</p>
	<p>“An individual’s stability or quick recovery (or even growth) under significant adverse conditions.”⁸⁰</p>
	<p>Resilience defined as “competence to cope and adapt in the face of adversity and to bounce back when stressors become overwhelming.”⁸¹</p>
	<p>“From the perspective of trauma researchers, resilience is defined as the effective adaptation after significant threats to personal and physical integrity.”⁸</p>

As these definitions above indicate, many researchers propose that resilience is a malleable trait, or behaviors, that can be developed. Others have pointed out that resilience may be a more stable capacity that resides within an individual.⁴² Furthermore, some people may have a genetic predisposition to resilience that is modified over their lifetime by environmental exposures,⁸² including the workplace. An integrated model of resilience needs to take into consideration the influence of personal, work, family and community resources that contribute to an individual's capacity to adapt to stress or to grow in the face of adversity.⁴² It follows that any program designed to build resilience will be effective only to the extent that it is possible to modify behavior, either at the individual or at the organizational level. It is also based on the premise that resilience is indeed a skill that can be learned and maintained.

Resilience Training Programs

Currently, there is no single accepted theoretical framework or consensus statement on what characterizes a resilience training program. There also is insufficient evidence to identify the essential elements of an effective program.⁹ Overall, resilience training programs seek to enhance resilience in individuals or groups. In the context of workplace health, they may improve ability to cope with, and recover from negative workplace stressors.^{83,76} Indeed, some researchers point out that interventions for stress management and resilience building overlap in their approach and content.⁴² Resilience programs use different theories of change that draw from a variety of disciplines, mostly psychology. The body of evidence between 1990 and 2014 provides some useful information on the strategic design of individual employee resilience training programs. The various types of resilience training programs, the theories that inform them and key considerations for content and delivery are discussed in the Appendix.



4. WHAT DO WE KNOW?

Methods and Data Sources in Brief

This report incorporates findings from three data sources that each provide employers with suggested practices for designing, implementing and evaluating resilience training programs in the workplace.

Data Source 1: Peer-Reviewed Literature (1990-2014)

Results from 28 unduplicated randomized control trials from four systematic reviews were synthesized.⁷⁻¹⁰ Two authors worked independently to extract data from these studies using a standardized data extraction form, which included an analysis of participant characteristics, program approaches and reported outcomes. Through consensus, a detailed Summary of Evidence Table was produced. Effect size data (Cohen's d statistic) were extracted from two meta-analyses⁹⁻¹⁰ or calculated from studies not included in the published meta-analyses. The Standardized Mean Difference (SMD) between intervention and reported control groups were used to evaluate the effectiveness of each study; 95% Confidence Intervals were used to assess whether results were due to chance or statistically significant.

Data Source 2: National Employee Survey on Resilience in the Workplace

The AHA and CEO Roundtable conducted a national employee survey to gain insight into employees' perception of and interest in resilience training programs. Also, the survey elicited feedback from employees to help inform future development and implementation of resilience-related programs, practices and policies in the workplace. The survey comprised a representative sample of 1,001 adults (age 18 and over) employed part or full-time in organizations with 25 or more employees that offer a healthcare plan and was conducted within the U.S. from July 31 – August 16, 2017.

Data Source 3: Employer Case Studies

Case studies present first-hand experiences of companies designing and implementing resilience programs and organizational policies and practices. Case studies were solicited from the AHA CEO Roundtable members, and resilience program vendors innovating in this field. Each case study describes their approach to developing or identifying a resilience training program, including challenges and lessons learned. The case studies also highlight the importance using evaluation to continuously assess implementation and the effectiveness of the program to achieve its intended outcomes.

RESULTS FROM THE LITERATURE SYNTHESIS

The current body of evidence suggests that resilience training programs in the workplace show a low to moderate – but statistically significant – effect on a broad range of physical, mental health, well-being, psychosocial and work performance outcomes. These findings are from a relatively small, yet growing body of evidence.

To place this topline finding in context, it is useful to briefly describe the populations studied and the features of the interventions used.

General Study Context

A total of 28 independent studies¹¹⁻³⁸ reporting analyzed data from 2,794 participants across four existing systematic literature reviews were synthesized.⁷⁻¹⁰ A detailed summary of the study characteristics, including the country of origin, setting, participant characteristics, intervention description, theoretical basis, population targeted, summary of findings and estimated treatment effect is available in the Appendix of this report.

Overall, studies had small sample sizes and only few explicitly defined resilience or measured it as part of the intervention. Most of the studies were conducted in the United States (64%), Australia (18%) and the United Kingdom (7%). Other countries in the sample were Israel, Sweden and Thailand. The average study sample size was 100 participants ranging from 18¹² to 463 participants.²² Five studies did not report program attrition (dropout), however, the average dropout from the start to last follow-up was 21%, ranging from 0%¹¹ to 41%.¹⁷ Five studies (18%) did not directly measure resilience even though they were included in one of the four literature reviews. Instead, these studies typically investigated stress management or depression interventions without applying a resilience framework and without directly measuring resilience.^{15,16,32,34} Indeed, half of the studies explicitly defined resilience and 46% measured resilience between the start of the program (baseline) and follow-up.

Populations Studied

A range of occupational settings were studied, with the highest proportion representing medical or healthcare (21%), universities (21%) and the military (14%). A few studies investigated resilience in sales managers, utility managers and government employees. The fact that healthcare settings such as hospitals and universities dominated the sample is not surprising, because these settings may be more oriented to conduct formal research and perhaps have the knowledge, capacity and incentive to apply for grant funding.

The average age of participants was 38 years, and 58% were female and 56% were Caucasian. Few studies reported participant characteristics based on the Consolidated Standards of Reporting Trials⁸⁴ and only a few studies collected or clearly reported data on important socioeconomic factors associated with health such as education and income. Given the small sample sizes, few studies could report on the statistical significance in differences of resilience outcomes in important employee population sub-groups, such as difference by gender, age, and race/ethnicity. Since some concepts of resilience may be global, and others more culturally specific,⁸⁵ it is important for researchers and practitioners to analyze data from different employee groups to reduce health disparities.

Program Features

The intervention programs used a variety of theoretical approaches to build resilience. Table 3 highlights the theories most frequently used.

Table 3. Most Frequently Used Theories

Theory & Definition	Applied Example
<p>Cognitive Behavioral Theory (CBT)</p> <p>Focuses on modifying dysfunctional thinking processes by learning to discriminate between distorted thoughts and reality⁸⁵</p> <p>Used in 50% of studies (13 out of 28), either alone or in combination.</p>	<p>Rose 2013:³² Stress Management and Resilience Training for Optimal Performance (SMART-OP) is a resilience training program originally developed for NASA. It is a self-guided, multimedia, CBT-based stress management and resilience training program.</p> <ul style="list-style-type: none"> • Thought activities teach the user cognitive flexibility and a structured approach to realistic/logical thinking with personally relevant stress content. Activities include compartmentalization and weighting evidence. • Activities teach the user to take effective actions to manage stress in their lives, including effective communication, strategic problem-solving and resilience through writing. • Users are encouraged to practice and apply these skills through homework assignments.

Theory & Definition	Applied Example
<p>Problem-Solving Model (PSM)</p> <p>Includes active learning centered on the investigation and resolution of real-world problems⁸⁷</p> <p>Used in 14% of studies (4 out of 28).</p>	<p>Cigrang 2000:¹⁵ Two 90-minute classes focused on coping efforts in basic training, designed to allow interaction among participants and opportunities for interpersonal learning. It targeted military trainees referred for a psychological evaluation from Air Force basic training and recommended for return to duty.</p> <ul style="list-style-type: none"> • A problem-solving approach was integrated by having the class identify potential coping responses to real training situations faced by participants. They then discussed potential consequences of the responses and were asked to choose the best alternative. • Non-referred trainees were included in the classes to serve as positive role models and sources of helpful information for referred trainees. • Participants were also provided education and practice in relaxation training and self-instruction skills consistent with stress inoculation therapy.
<p>Stress Inoculation Theory (SIT)</p> <p>Exposes individuals to forms of stress in a controlled process to education and helps participants build skills to address stress and avoid the negative outcomes of stress⁸⁸</p> <p>Used in 11% of studies (4 out of 28).</p>	<p>Varker 2012:³⁷ A 40-minute session based on SIT was incorporated into training for emergency personnel.</p> <ul style="list-style-type: none"> • Sessions focused on increasing a sense of controllability, reducing unexpectedness and desensitizing the person to likely stressful events. • Skill-building topics included: education about physical responses to trauma; applied tension techniques; stopping techniques for inappropriate thoughts; importance of social support; and education about appropriate and non-appropriate drug and alcohol use.
<p>Psychological Capital (PsyCap)</p> <p>Involves building four capacities described as independent and malleable to change: resilience, self-efficacy, optimism and hope⁹⁰</p> <p>Used in 11% of studies (4 out of 28).</p>	<p>Luthans 2010:²⁸ This online workplace health program included two 45-minute sessions that target building resilience, self-efficacy, optimism and hope.</p> <ul style="list-style-type: none"> • Sessions focus on goals and pathways, obstacle planning, building efficacy/confidence, developing positive expectancy, building assets/avoiding risks and influencing the process. • Video presentations invite participants to consider examples of resilience and efficacy in dramatized settings. Participants were also asked to consider and develop courses of action for real workplace situations.

More than half of the programs (54%) were made available to all employees regardless of an assessment of their resilience at baseline. In other words, resilience programs were most often provided as universal or primary prevention programs. Almost three-quarters of the studies (71%) focused on mitigating the negative effects of generalized stress compared to traumatic stress. The minority of studies focused on traumatic stress included reducing post-traumatic stress in military populations²⁴⁻²⁵, or first responders such as police officers¹² or emergency services personnel.³⁷

There was also great variation in program delivery formats, duration and follow-up. Almost half of studies (46%) used a group-only delivery format, usually in a classroom style, followed by technology-only interventions (25%), and multimodal programs using different delivery formats in combination (14%). The average program duration was about 17 hours (ranging from 1 hour to 40 hours). The average follow-up time after the program ended was less than three months (ranging from 0 to 12 months).

Outcomes Studied

A wide range in outcomes was reported broadly comprising physical, mental health, psychosocial and work performance metrics. Table 4 below summarizes outcomes reported in the 28 RCTs¹¹⁻³⁸ and the four systematic reviews.⁷⁻¹⁰

Table 4. Summary of Outcomes Measures

Outcomes Measured in the Analyzed RCTs¹¹⁻³⁸ (N=28)			
Physical & Biological Outcomes	Mental Health & Well-Being	Psychosocial	Work Performance Outcomes
<ul style="list-style-type: none"> • Antithrombin • Cortisol • Heart Rate • Fatigue 	<ul style="list-style-type: none"> • Resilience • Anxiety • Depression • Stress • Happiness • Negative Mood • Mental Clarity • Subjective Well-Being 	<ul style="list-style-type: none"> • Life/Job Satisfaction • Optimism • Self-Efficacy • Sense of Control • Job Satisfaction • Interpersonal Relations • Purpose • Self-Compassion 	<ul style="list-style-type: none"> • Gross Margin • Product Sold • Observed Performance • Goal Attainment
Outcomes Measured in the Systematic Reviews⁷⁻¹⁰			
<ul style="list-style-type: none"> • Fasting Blood Glucose • Total Cholesterol • C-Reactive Protein • Body Mass Index (BMI) • Systolic Blood Pressure • Diastolic Blood Pressure • Physical Activity (Minutes/Week) • Physical Ill-Being • Exhaustion • Sleeplessness • Body Aches • Indigestion • Rapid Heart Rate 	<ul style="list-style-type: none"> • Negative Affect • Positive Affect • Sadness • Stress Load • Psychological Well-Being • Work-Life Fit • Work-Life Balance • Autonomy • Mastery • Growth • Positive Relations • Purpose • Self-Acceptance • Vigor • Anger • Vitality 	<ul style="list-style-type: none"> • Acceptance • Social Support • Morale • Optimism • Coping Self-Efficacy • Work Satisfaction • Peacefulness • Goal Clarity • Communication Effectiveness • Positive Outlook • Motivation • Calmness • Resentfulness • Anger Management • Hope 	<ul style="list-style-type: none"> • Successful Task Completion • Self-Rated Performance • Productivity

As noted above, few studies evaluated the effect of resilience training programs on important physical and behavioral outcomes, including Life's Simple 7, the American Heart Association's definition of ideal cardiovascular health. **Life's Simple 7** comprises three health behaviors (not smoking, being physically active, having a healthy eating pattern) and four biometrics (Body Mass Index, blood pressure, total blood cholesterol and blood glucose). Since heart disease and stroke are the number one and five causes of premature mortality in the United States respectively,⁹¹ and job strain increases the risk of heart disease,³ future research on resilience would benefit from a better understanding of how maintaining resilience affects health outcomes, including the leading risks for heart disease and stroke.

Furthermore, none of the studies included an assessment of intervention cost, or the cost-effectiveness of the resilience program. Furthermore, few studies reported on any potential harms or unintended consequences on resilience training program participants. It is important for researchers to anticipate potential harms that may arise from psychologically focused interventions and to report them transparently, such as potential stigmatization of employees that screen for low resilience or high stress, and that may be targeted to participate in resilience programs.

Effectiveness

Current evidence from the two published meta-analyses^{9,10} suggests resilience programs have a statistically significant yet low to moderate, short-term effect at improving all reported outcomes ("pooled treatment effect").

OUTCOME COMPARISONS	
Pooled Treatment Effect	The Standardized Mean Difference (SMD) or Cohen's d (Cohen, 1977), is a statistic used to compare the pooled or combined effect of all outcomes as measured by the difference between the mean difference between the treatment and control groups. One can interpret the size of the treatment effect using Cohen's d, with values closer to 1 indicating larger differences in the outcomes between the treatment and control group as a result of the intervention: 0.20 ≈ small 0.50 ≈ moderate 0.80 ≈ large
95% Confidence Interval (CI)	This statistical method gives a lower and upper range that will be correct 95% of the time. In other words, this range would fail to estimate the true effect only one out of every 20 times.
Statistical Significance	When using the 95% CI, a value or estimate is not statistically significant if zero is included within the lower to upper estimates.

The reported pooled treatment effect ranged from 0.21 [95% Confidence Interval 0.13-0.29] to 0.36 [95% Confidence Interval 0.18-0.57].^{9,10}

This low to moderate level of effectiveness of resilience training programs is similar to other primary prevention approaches documented such as mindfulness training³⁹ and depression prevention programs,⁴⁰ but weaker than those reported for secondary prevention programs that focus on stress management.⁴¹ While the current evidence indicates resilience training programs have modest effects at the individual level, it does not diminish the potential value to employers. The observed small individual effect sizes may have larger benefits at the organizational level.⁹²

Overall, outcomes appeared to diminish between 1-3 months from intervention, although one review reported evidence that while resilience diminishes within a month of follow-up in general populations, resilience appears to increase over time in people who are at risk of high emotional distress.¹⁰ The authors also found that more intensive delivery formats like personalized coaching and group-based learning showed stronger effects compared to computer-based and train-the-trainer formats.

Approximately one in four studies (6 out of 25 studies with complete data) reported positive, statistically significant results across all measures combined (“pooled treatment effect”). Table 5 presents selected information of program implementation features and outcomes from these studies. The average intervention length was less than five hours, ranging from a 90-minute one-to-one intervention to improve resilience among physicians³⁵ to an eight-hour group-based intervention among college students.¹⁷ In contrast, the longest program in the sample – 40 hours of training among military trainees³⁸ – appeared to have a positive effect, but it was not statistically significant. There does appear to be a pattern that programs that seek to reduce generalized stress through one-to-one or group formats are associated with better short-term outcomes. Since the average sample size is so small, and only few technology-enabled programs (25%) were included in the total sample size, this observation should be treated with caution. Finally, most of the settings studied were higher education academic institutions and clinical settings, so these positive findings may not apply to other occupational settings like manufacturing, retail or finance.

Integration with Employee Assistance Programs

Employee Assistance Programs (EAPs) were created in the 1940s to address the growing problem of alcohol abuse on worker productivity. Since then, EAPs have evolved significantly to confidentially provide a range of services at no cost to employees and their families, including behavioral health counseling, health promotion education and psychological first aid. In addition, EAPs support employers with issues such as organizational performance management, managing critical incidence stress and workplace violence. Almost 7 in 10 EAPs are provided by external vendors to employers, either via independent, hospital-based or standalone entities (40%) or by health plans or managed care (29%).⁹³

Even though 77% of employers provide EAPs to their employees in 2017,⁹⁴ participation in these important programs is very low compared to other health and well-being programs offered by employers. In 2016, 7% of Boomers, 12% of Gen Xers and 23% of Millennials participated in EAPs offered by their employer. In contrast, 62% of Boomers and Gen Xers participate in biometric screenings, and 56% of Millennials.⁹⁵ The comparatively low participation in EAPs may be the result of employers not offering financial incentives to access EAP services, while incentivizing health risk assessments and biometric screenings. It may also be a function of a fear of stigma and low trust among employees about their employers’ access to their personal health information. For example, the 2016 AHA - Nielsen Employee Health Survey found that while 65% of employees agreed strongly or somewhat strongly that they would not feel comfortable with sharing their personal health information with their employer, three in five employees reported that they would be willing to share their data with a non-profit organization.⁴⁴

According to a 2016 Willis Towers Watson national survey, 75% of U.S. employers see stress as the number one workplace issue.⁹⁶ However, another influential survey by SHRM indicated that less than one in ten employers offer onsite stress management programs.⁹⁴ Given the high level of workplace related stress cited in this report, and the conceptual overlap between resilience, stress management and depression prevention, employers could consider leveraging their EAPs to offer resilience training programs to complement existing stress management programs. Offering resilience oriented programs through telephonic coaching, and online or mobile platforms, has the potential to address cost barriers to scaling up onsite, group-based formats. As the MeQuilibrium case study in this report indicates, EAPs and other resilience vendors using technology-enabled platforms may be successful in reducing rates of absenteeism, which could yield cost-savings to employers.

If employers wish to engage their EAPs to provide resilience training programs, they are encouraged to use Table 1 and the Recommendations for Measuring Resilience.

Table 5. Summary of Studies with Positive, Statistically Significant Outcomes

Study	Population Characteristics	Theoretical Basis	Framework	Format & Length	SMD	95% CI
Bekki 2013	U.S. College students; mean age 27 years; 100% female; 70% white	Multiple, including Cognitive Behavioral Therapy (CBT), problem-solving	Targeted; Generalized; Stress; Resilience Directed	One-to-one training; 5 hours	0.66	0.31 – 1.00
Dolbier 2010	U.S. College students; mean age 21 years; 18% female; 42% white	CBT + Problem Solving Model (PSM)	Universal; Generalized Stress; Resilience Directed	Group-based curriculum; 8 hours	1.92	0.28 – 3.5
Luthans 2010	U.S. College students; mean age 36; 46% female; 76% white	Psychological Capital (PsyCap)	Universal; Generalized Stress; Resilience Directed	Group-based curriculum; 2 hours	0.53	0.30 – 0.77
Sahler 2013	U.S. mothers of children recently diagnosed with cancer; mean age 37; 61% white	PSM	Targeted Population; Trauma Directed; Neither Resilience Directed nor Mediated	One-to-one counseling; 8 hours	0.29	0.05 – 0.54
Songprakun 2012	Diverse patient population in Thailand; mean age 37; 73% female	CBT using bibliotherapy i.e., written self-help guides	Targeted; Generalized Stress; Neither Resilience Directed nor Mediated	Self-guided bibliotherapy; average time duration not reported	1.01	0.44 – 1.58
Sood 2011	U.S. physicians at a single healthcare facility; mean age 49; 47% female; race not reported	Attention and Interpretation Therapy (AT)	Universal; Generalized Stress; Resilience Directed	One-to-one counseling; 1.5 hours	1.04	0.08 – 1.81

Key:

SMD = Standardized Mean Difference or Cohen's d effect size

95% CI = 95% Confidence Interval

CBT = Cognitive Behavioral Therapy

PSM = Problem Solving Model

PsyCap = Psychological Capital Model

AT = Attention and Interpretation Theory

Universal = All employees eligible for program (Primary Prevention)

Targeted = Program offered to employees assessed to be at risk (Secondary or Tertiary Prevention).

Resilience Directed = Study defined resilience and measured it

Resilience Mediated = Study did not measure resilience directly.

Limitations

There are several limitations to the literature synthesis that should be considered when interpreting the results:

- Across studies, there was inconsistency in how resilience was defined and measured. This may have affected the content and construct validity of their resilience training programs and measurement tools.
- Included studies from the four systematic literature reviews featured stress management or depression prevention interventions, including two studies with significantly positive outcomes.^{33,34} This may overstate the overall treatment effect of programs explicitly addressing resilience.
- The two studies that performed meta-analysis pooled treatment effects across all outcomes to produce one effect size (Standardized Mean Difference). This analytical approach was probably selected due to the small sample size of studies. As the body of evidence on resilience programs grows, researchers may be able to perform this type of analysis for individual outcomes.
- Studies from 2015 to present are not included in this analysis because only literature referenced from four existing systematic reviews were considered. The new literature review and meta-analysis currently underway by Helmreich and colleagues will provide an updated assessment of the effectiveness of programs.⁹⁷
- A systematic review on physician burnout⁹⁸ was not included because of the highly specialized setting and specific interventions that may not be generalizable to non-clinical settings. Healthcare employers interested in preventing physician burnout are encouraged to read the review by West and colleagues.
- A meta-analysis on the impact of PsyCap on employee attitudes, behaviors and performance was not included due to limited time.⁹⁸ In addition, PsyCap was not explicitly within the scope of our review. Nevertheless, three studies using PsyCap were included in our review of resilience because they were reported in the four systematic reviews used for the literature synthesis.^{22,27,28}
- Non-randomized control trials were excluded from the study analyses due to time constraints. Including these studies could have shed more light on program design features; however, the estimates of effect provided by the RCTs in this review provide a more conservative estimate of the effectiveness of resilience training programs in the workplace.
- The small number of studies with low sample sizes, high dropout and short follow-up provide limited scientific evidence and do not allow for definitive conclusions about the specific features of effective resilience training programs.
- Finally, no systemic interventions were identified in the published literature based on key word searches, which limits a discussion on effective organization-level strategies aimed to build resilience and complement individual programs.

In summary, the resilience literature suggests that resilience training programs in the workplace have low to moderate, but statistically significant, effects on a broad range of physical, mental health, well-being, psychosocial and work performance outcomes. Yet, findings should be interpreted with caution, especially given the same number of studies available and lack of consistency in how resilience is defined and measured. More research is needed to better understand how effective resilience training programs are in specific workplace settings.

RESULTS FROM THE EMPLOYEE SURVEY

The Workplace Resilience Survey was conducted to gain insight regarding employees' potential value of, and interest in, resilience training programs and to solicit feedback to inform design and implementation of resilience training programs in the workplace.

The AHA conducted research with the U.S. workforce to gain insight into employees' perceptions of resilience training interventions in the workplace, by gauging the following:

- **Interest** in workplace resilience training programs
- Perceived **value** of workplace resilience training programs
- Approaches to **design** and **implementation**

Results indicate that resilience training programs are likely to have a wide range of perceived positive individual outcomes for employees.

The survey defined resilience as:

the ability to withstand, recover and grow in the face of stressors in the workplace and changing work demands.

The online survey was conducted by Harris Poll within the United States from July 31 – August 16, 2017 among a representative sample of 1,001 adults (age 18 and over) employed part or full time in organizations with 25 or more employees that offer a healthcare plan. Overall, results from the survey support that resilience training programs are perceived by employees to be beneficial to them. For employers, this may serve as a good marker that the investment in these types of programs may be worth the return.

We discuss findings across generational, income-level and educational attainment groups, where results were shown to be statistically significant.

- **Generational groups were defined as:**
 - o Younger Millennials, ages 18-27 (n= 101)
 - o Older Millennials, ages 28-36 (n= 189)
 - o Gen Xers, ages 37-51 (n= 289)
 - o Baby Boomers, ages 52-70 (n= 359)
 - o Matures, ages 71+ (n= 63)

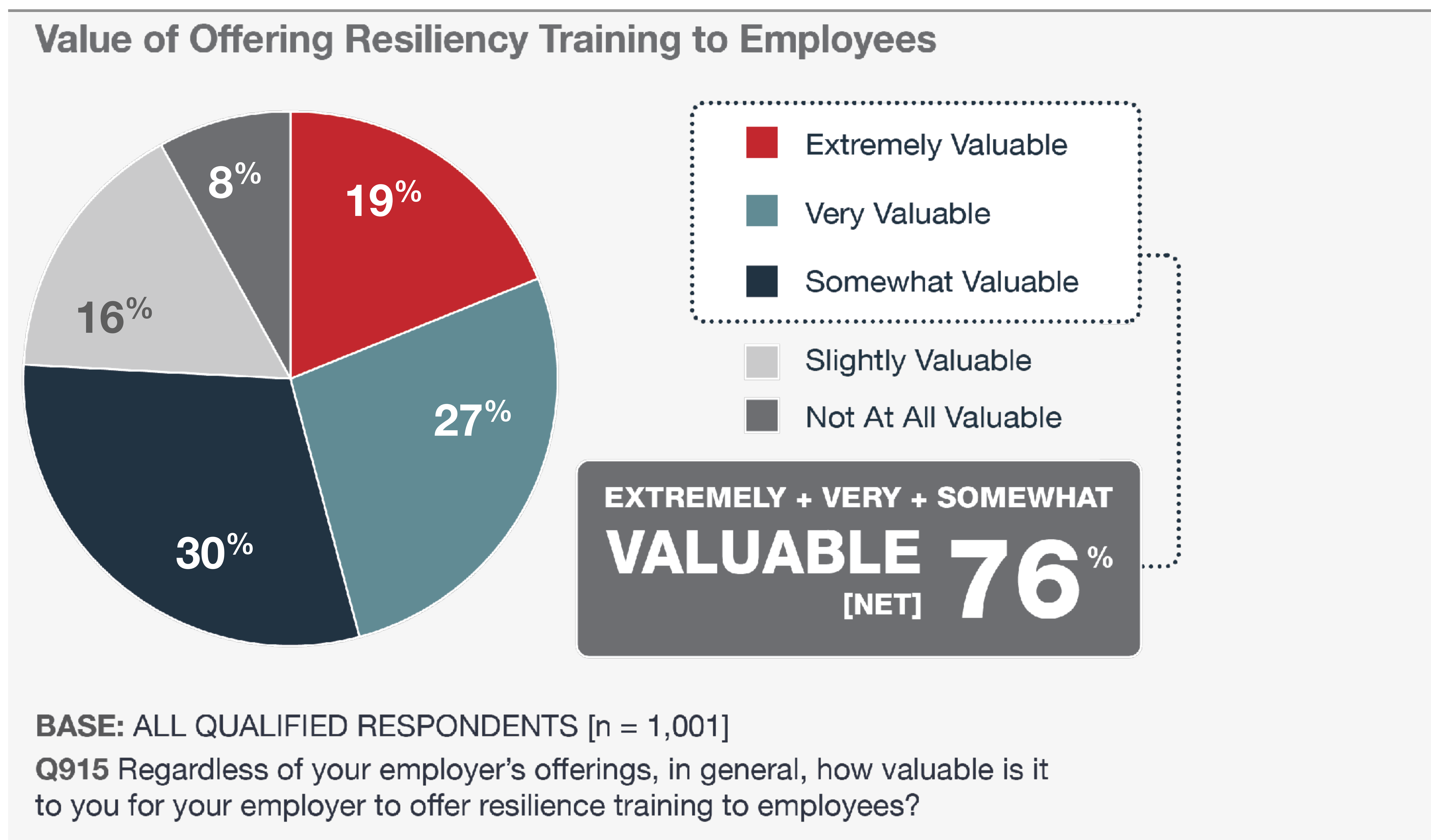
The sample size for Matures is less than 100, so results for this group are directional in nature.
- **Income groups were defined as:**
 - o Individuals with a household income of less than \$50k annually (n=276)
 - o Individuals with a household income of \$50k or more (n=666)
- **Educational attainment groups were defined as:**
 - o Individuals with a high school degree or less (n=103)
 - o Individuals with more than high school education (n=898)

Insights gained from examining results across generation, income and educational attainment can call attention to key design-, implementation- and evaluation-related actions employers can take to ensure the needs of all their employees are met, including needs of sub-populations more likely to experience health disparities. More information on the survey methods can be found in the Appendix.

The Value of Offering Training to Employees

Overall, results indicate that resilience training programs are perceived as having value among employees who have participated and among those who have not (76% in total). When asked to assess the value as it relates to the potential health benefits, there was little to no differentiation across health areas, with most employees saying that training would provide benefit to overall physical health (90%), well-being (90%), stress management (90%), mental health (89%) and cardiovascular (heart) health (88%).

Figure 3: Value Survey Results



When looking across generations, millennials find training extremely valuable for stress management (47%), mental health (44%) and well-being (43%).

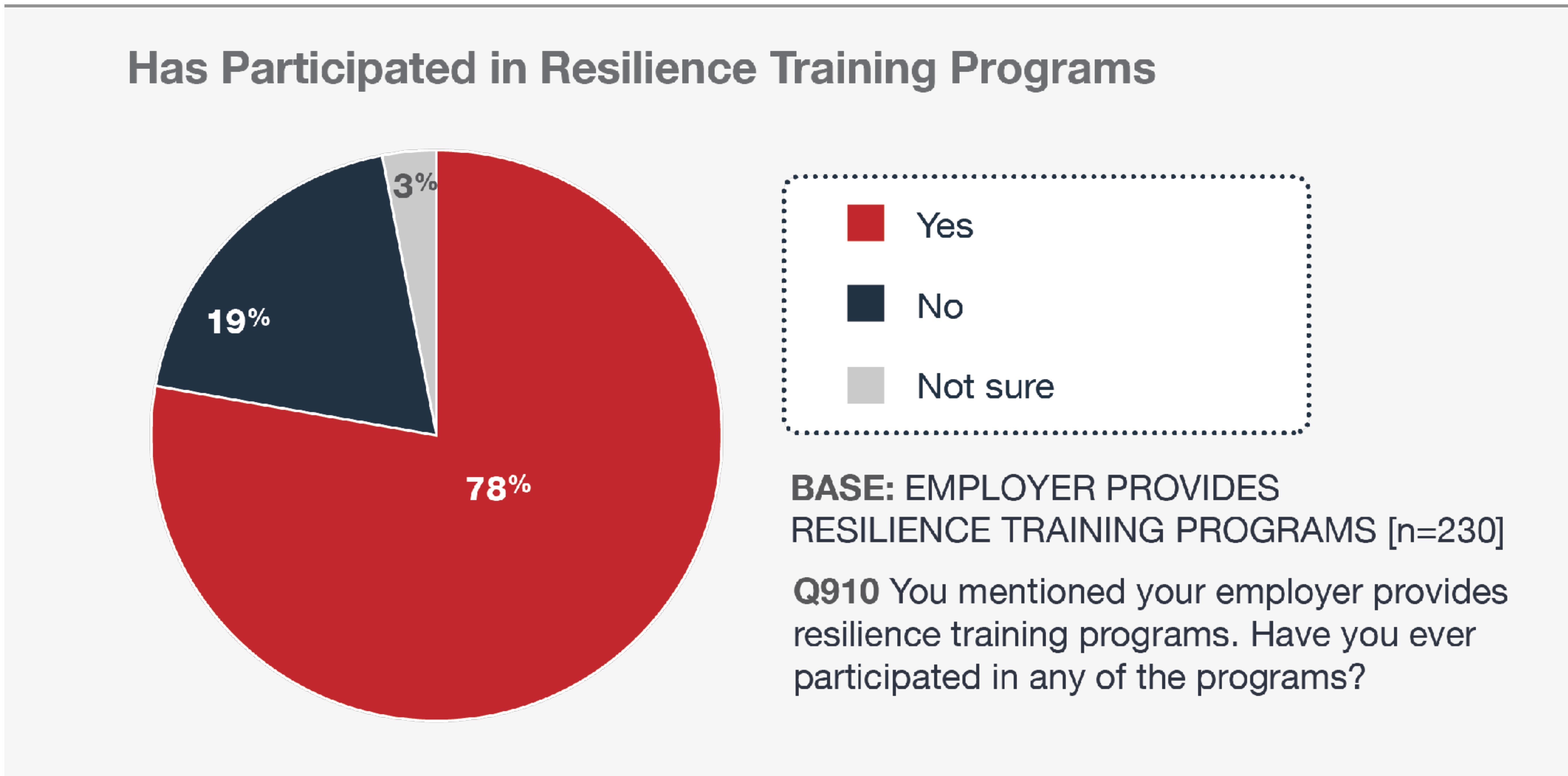
Value employees place on training programs varied across income levels, with those with higher incomes more likely to say they see at least some value in the programs (79% vs. 67%). Interestingly, when asked about value of training as it relates to potential benefits in specific health areas, significant differences between the two groups disappear except for programs geared toward the potential benefits to cardiovascular health – those with higher incomes are more likely to say they would find these types of programs very or extremely valuable (62% vs. 50%). When looking at the data by educational differences, the story is similar, though more pronounced. Participants with more than a high school education are likely to indicate programs are at least somewhat valuable (80% vs. 63%).

Although results demonstrate that employees value resilience and its potential benefits as related to other health areas, it's important to recognize that value varies across groups by generation, income and education attainment. Those who may not perceive any value in the training may also be less likely to participate. Better understanding the perceptions and attitudes of sub-populations who are less likely to see value in resilience training programs may provide insight on health-related needs, barriers and potential opportunities.

Encouraging Participation

One in four report resilience training programs are offered by their employer. When programs are offered, however, participation is high (78%) which indicates that resilience training programs may be tapping into a need that is unmet by other types of wellness offerings.

Figure 4: Participation In Resilience Training Offerings



While participation is high among those who are offered resilience training programs, nearly one in five employees do not participate even if a training program is offered through their employer. This lack of participation may signal a need for increased communication on the employer side and clear descriptions about the goals of resilience training programs.

To maximize participation, employees feel a variety of incentives could be useful for increasing participation in resilience training programs. Monetary incentives as well as time off during the day may be the most effective paths to boosting participation.

Figure 5: Potential Incentives



Management involvement has the potential to increase participation – especially among those who have already engaged. The majority of those who have participated say management involvement (86%) would make them more likely to participate in programs with 78% specifically saying C-suite involvement would positively impact their likelihood to participate.

Potential Individual-Level Benefits of Resilience Training Programs

Employees attributed a variety of health outcomes to participation in resilience training programs, including having more energy (51%), exercising regularly (45%), and improved quality of life (41%). Further, those who have participated say, overall, their health has improved a great deal or fair amount because of the resilience training (73%). And, 80% of those who are offered resilience trainings programs say the availability of the programs have a strong or very strong impact on their commitment to their health.

Potential Organizational-Level Benefits of Resilience Training Programs

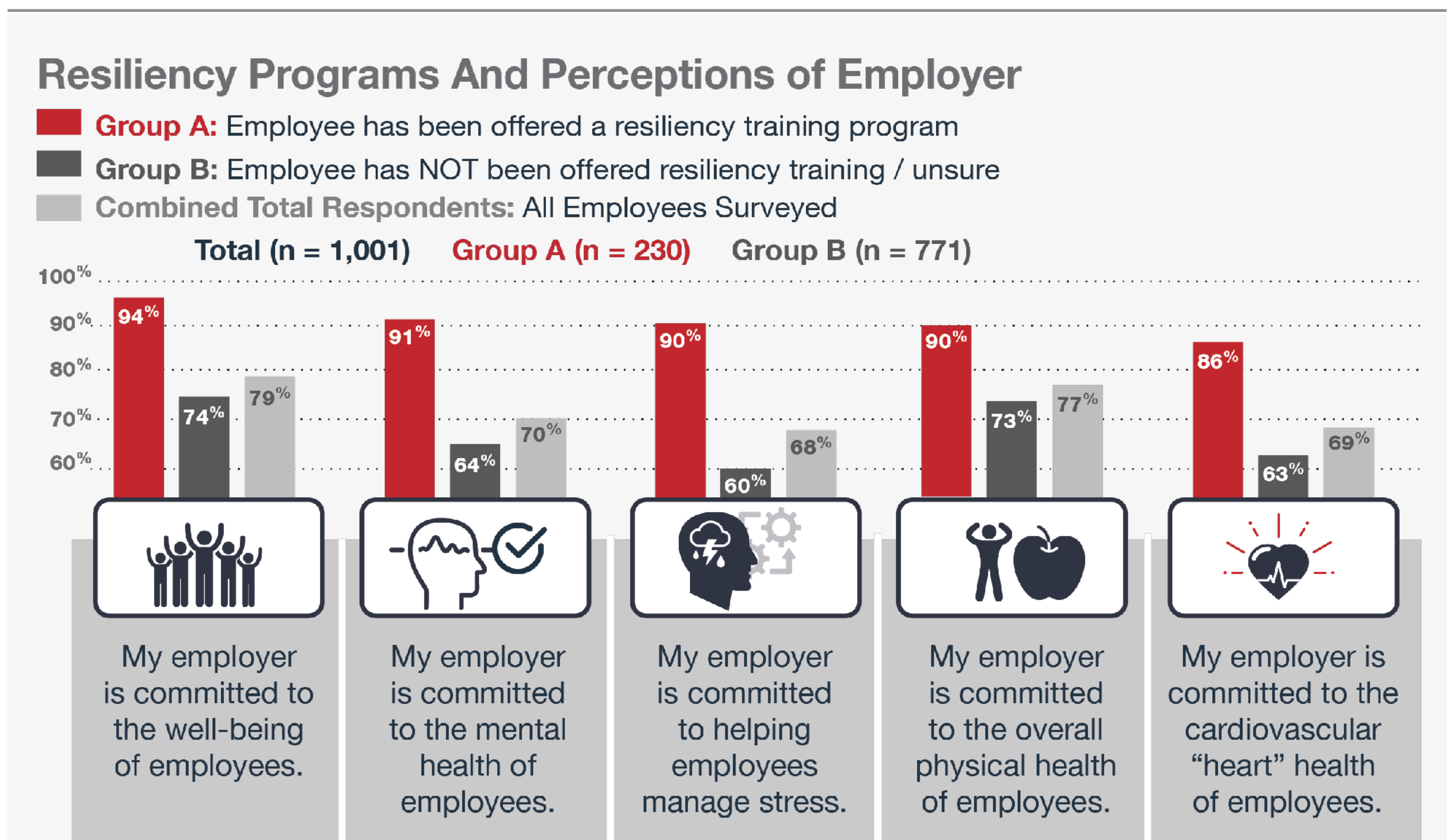
Results indicate that participation in resilience training programs positively influences employees’ perceptions of, and, commitment to, their employers. For example, a majority (94%) of participants say the availability of the programs have a moderate, strong or very strong positive impact on their commitment to their employer.

And, those who participated are significantly more likely than those who did not participate or who were not offered a program to agree their employer is committed to the well-being of employees (95% vs 75%).

The majority of those who participated (94%) agree:

My employer gives me the training I need to withstand, recover and grow in the face of stressors in the workplace and changing work demands.

Figure 6: Perceptions of Employers’ Commitment



What topics should my resilience training include?

There is overwhelming interest in a broad range of resilience topics. While all areas of resilience training program strategies are of interest, the most commonly reported reasons for being at least somewhat interested are to deal with difficult people (82% - extremely interested 31%, very interested 28% and somewhat interested 23%) and improve physical health (81% - extremely interested 26%, very interested 31% and somewhat interested 24%).

Figure 7: Resilience Topics By Interest Level

Interest in Specific Topics of Resilience Training Program Strategies

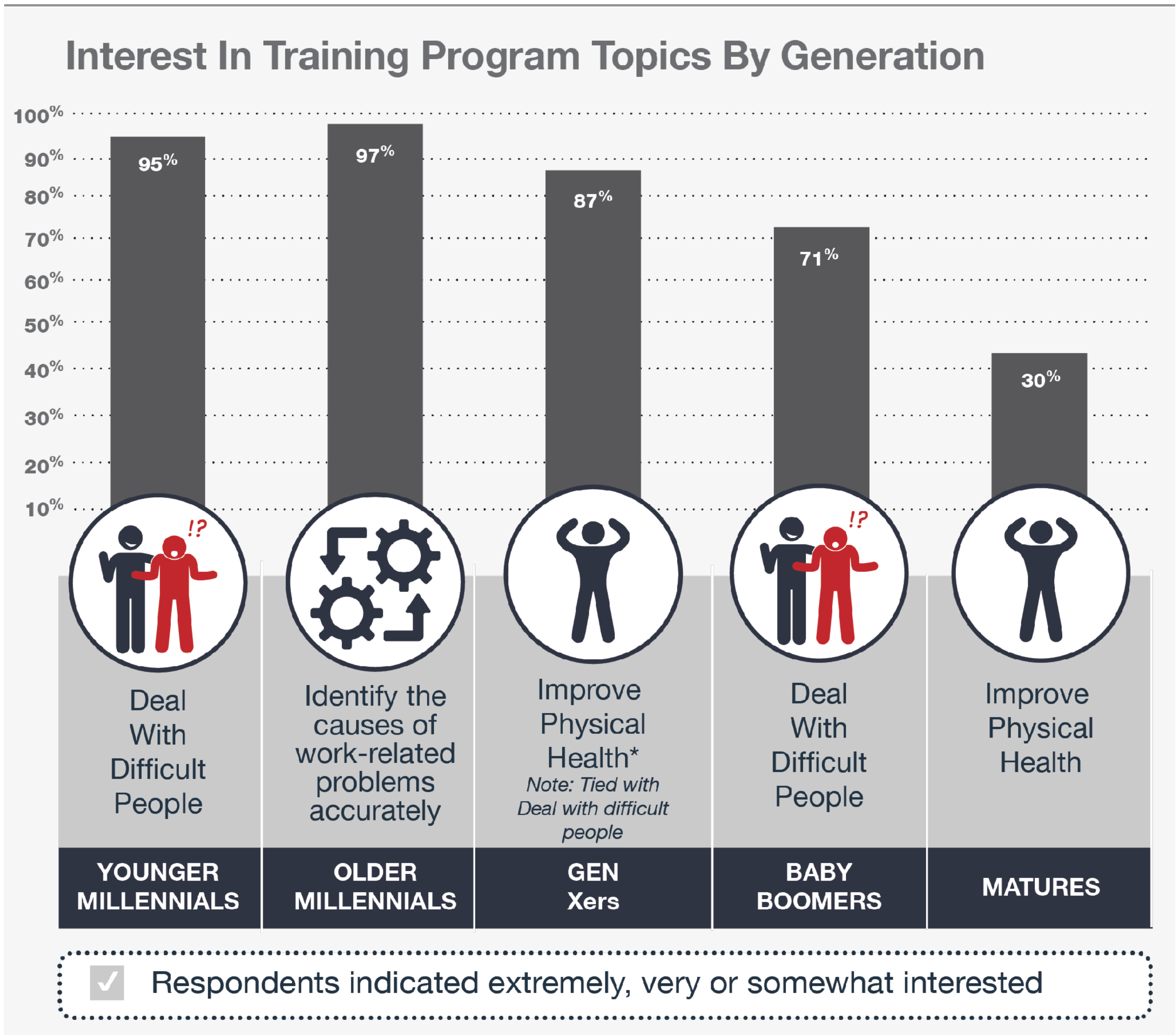


BASE: ALL QUALIFIED RESPONDENTS (n=1,001)

Q1005 Using the scale below, how interested would you be in resilience training programs focused on teaching you strategies to ... ?

Millennials, in general, also tend to show the most interest in training strategies offered in resilience training programs.

Figure 8: Resilience Topics - Interest By Generation



Interest in program topics and delivery formats also varies by income. Across all topics presented to employees, those with higher incomes show higher levels of interest. With that said, the two groups are most aligned on their interest in training focused on dealing with difficult people (61% for \$50K+ vs. 60% <\$50K reporting they are extremely or very interested), improving sleep habits (58% vs. 54%) and improving poor communication with co-workers (54% vs. 50%).

Participation in resilience training programs not only have the potential to improve individual and organizational health, they also have the potential to positively influence perceptions of employers and to also strengthen commitment to employers.

CASE STUDIES

The case studies showcase how employers are using innovative approaches at the workplace to mitigate and manage stress as an employee health risk through sound organizational policies. By putting a focus and emphasis on building a supportive environment where employees can rest and recover, employers provide resources to manage stress and create a culture of resiliency.

Each of the companies highlighted takes an iterative, comprehensive and holistic approach to building resilience as part of overall health and well-being strategies.

Deloitte.

Johnson & Johnson

KKR

me  **Quilibrium**

CASE STUDY: Deloitte.

Building a resilient workforce

At Deloitte, we believe that well-being isn't mutually exclusive to performance – it's needed to meet the demands of a fast-paced industry. In professional services, people are our greatest asset and we want them to be at their best at work and at home. **Our professionals help clients solve big problems, so they need to be focused and innovative.** That's why we invest in the well-being of our people through our holistic program **Empowered Well-being**, and support them in body, mind and purpose. We also know that every professional will experience periods of stress – it may be driven by a big project, a leadership change, or even an unexpected issue at home. Regardless of the cause, we provide resources to help manage stress and opportunities throughout the year for strategic recovery to build long-term resiliency. Our strategy is simple – we embed resiliency in our culture by providing: education and resources on effective stress management strategies, time for our people to disconnect and recover, and programs that can support a range of life events. And our leaders are critical to our strategy by communicating, role-modeling and encouraging positive behaviors.



Rest and recovery

When it comes to addressing stress, building in time for rest and recovery is key. We collectively disconnect as an organization on holidays and two well-being days each year. This year, we expanded those two well-being days to create a “year-end shutdown” between Christmas and New Year’s so we can all spend time with friends and family.

The holidays are one opportunity for our people to disconnect, but for some they aren't always relaxing. So we also encourage them to leverage our generous paid time off (PTO) throughout the year so that they can spend time recharging, whether that's traveling, spending time with loved ones, doing a favorite hobby, or simply relaxing. We do this by providing our people with resources to help them plan their PTO effectively so they can truly disconnect, called the PTO Etiquette guide. We encourage managers and leaders to make time-off a part of on-going performance conversations. And our Vitals dashboard is helping us preemptively identify those that may be at risk of burnout through a data-driven approach (you can learn more about Vitals online.)

Education and resources

Resiliency starts with learning smart strategies for dealing with stress. We provide our people with educational opportunities and resources so they can learn behaviors that are easy to embed in their everyday lives and we endeavor to embed these into our ongoing training programs. For instance, our **Bounce back** and **Upside of Stress** well-being guide and micro-learning provides practical exercises for stress management and recovery. These resources help our professionals learn how to build recovery into their day with simple micro-behaviors like taking a few minutes for deep breathing, or scheduling 25/50-minute meetings to create buffers in between. They also provide a greater understanding for ways to leverage stress in positive ways like reframing and playing to your strengths. We also offer in-person and virtual classes on energy management, providing a more multi-disciplinary approach that pulls together the sciences of performance psychology, physiology and nutrition for a holistic foundation to resiliency. In response to the initial pilot of our in-person class, **more than 98% of respondents said that they benefitted from participating in this program, and a full 100% said they would recommend the course to others.** “In my entire professional career, I have never called a training program ‘life-changing.’ This was life-changing. After this program, I feel fully empowered to take control of my well-being,” said one participant after completing the program.

Mindfulness and meditation can be an effective strategy to managing stress and incorporating recovery into your day, so we provide education and resources to help our people learn how to build and sustain a restorative and relaxing meditation practice, including an in-person, science-based program designed to deepen mindfulness and self-awareness. **Of the initial pilot, 90% of participants thought the course was a valuable use of their time and the same percentage felt like they could immediately apply the lessons learned from the course.** Our virtual chair yoga program includes 20-minute virtual webinars conducted by Deloitte's very own professionals who also happen to be certified yoga instructors. They walk participants through a series of gentle exercises and breathing techniques that can be done from the comfort of an office, cubicle or home. As one participant explained, "it helped me learn moves I can use throughout the day, while on calls etc. I truly felt more focused and positive for the rest of my day afterwards." And for those on the road, our micro-learning, well-being guide, and Yoga on the go resources provide easy tips and practices that you can do anywhere at any time.

Supporting the life journey

Family Leave



Throughout the life journey, many milestones can become the catalyst for stress. Whether it's the birth of a child, or dealing with an unexpected family illness, time is essential to address changing family needs. In 2016, Deloitte announced its Family Leave Program to provide greater support for these life events. The program offers eligible professionals up to 16 weeks of fully paid leave to support a wide range of life events, such as bonding with a new child or caring for a spouse/domestic partner, parent, child, and/or sibling with a serious health condition. While some professionals may never need the program, many have provided the feedback that knowing it is there offers piece of mind.

Sabbatical Opportunities



Our people have a diverse range of personal and professional interests, from unique hobbies, to volunteer and pro-bono work. No career journey looks alike. For those that want time to pursue these other interests and passions, we offer two sabbatical programs. One is an unpaid one-month sabbatical that can be taken for any reason and the other is a three to six month sabbatical that can be taken to pursue personal or professional growth opportunities in the areas of career development or volunteerism for 40% of their pre-sabbatical base salary. Sabbaticals allow our people to take time away from work to focus on their passions so they can return energized and focused.

The journey continues

Each year we conduct a talent survey to measure employee engagement around well-being, trust and integrity, future vision, and more. From FY15 to FY16 our survey reported a double-digit jump in well-being and our recent survey continues to trend in the right direction. Employees indicated a higher rate of satisfaction with stress level and support, indicating that continued investment and action has resulted in meaningful improvements across the organization. **Additionally, our 2017 ranking for the Fortune 100 Best Companies to Work For jumped an astounding 26 points from last year.**



At Deloitte we see resilience as a key part of our well-being journey. Our investment in resilience related education and programs is a step in the right direction for us. Over the next years, we will be developing more well-being and resilience related educational programs to help our people learn and implement strategies and behaviors that help them perform at their best, and continue to look for ways to innovate our well-being related offerings to meet the evolving needs of our people.

About Deloitte

Deloitte provides industry-leading audit, consulting, tax and advisory services to many of the world's most admired brands, including 80 percent of the Fortune 500. Our people work across more than 20 industry sectors to deliver measurable and lasting results that help reinforce public trust in our capital markets, inspire clients to make their most challenging business decisions with confidence, and help lead the way toward a stronger economy and a healthy society.

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“ In my entire professional career, I have never called a training program ‘life-changing.’ This was life-changing. After this program, I feel fully empowered to take control of my well-being. ”

- Participant's quote after attending initial pilot program

CASE STUDY: *Johnson & Johnson*

Background

Caring for the world, one person at a time, inspires and unites the people of Johnson & Johnson. We embrace research and science—bringing innovative ideas, products and services to advance the health and well-being of people. Our approximately 132,500 employees at more than 250 Johnson & Johnson operating companies work with partners in health care to touch the lives of over a billion people every day, throughout the world.

This undertaking starts with caring for our own workforce. Inspired by our Credo — that anchors our actions to ensure Johnson & Johnson makes the needs of the people a top priority, our company has a 100+ year legacy of improving and sustaining the health and wellness of its employees. Believing that caring for the health and well-being of its employees is not only good for the health of the business, but ultimately good for the health of families, customers and patients everywhere.

HealthForce 2020 is Johnson & Johnson’s innovative, integrated approach to support healthy choices and healthier lives through a culture of health. Because our people are at the center of what we do, we have established 2020 goals that enable and inspire every one of us to achieve our personal best in health and well-being. These goals are based on our populations’ top health risks (physical inactivity, unhealthy eating and stress), and provide integrated solutions that allow for choice, customization and connection. Through these scalable and customizable programs and services, we are providing precision wellness solutions that are adaptable to our global workforce and that address the whole person.

The HealthForce 2020 goals will be obtained by:

- **Linking science-based training to every individual’s unique purpose and mission through Energy for Performance® training.**
Goal by 2020: Train at least 100,000 employees in the principles of energy management.
- **Empowering and sustaining healthy habits with customizable, scalable digital health tools that reward healthy behavior, through gamification, education and networking.**
Goal by 2020: Connect at least 100,000 employees to their health via digital health tools.
- **Creating an environment and culture of Healthy Eating and Healthy Movement so the healthy choice is the easy choice.**
Goal by 2020: At least 100,000 employees will have access to fully implemented Healthy Eating and Healthy Movement policies.

Resilience Program Rationale

Train at least 100,000 employees in the principles of energy management by 2020

In 2009, Johnson & Johnson began offering the Energy for Performance® training to its employees. According to American Psychological Association, in 2015, 64 percent of adults in the U.S. reported work as their top stressor and 34 percent stated that their stress had increased over the past year. So, we recognized that to sustain high performance in this type of environment, it is important to help our employees build their resilience so they can better recover, adapt and grow from stress. We also surveyed our customers to understand what they are trying to solve for within their own workforces and many identified that workforce stress was a top concern.

The Energy for Performance® training is derived from the Corporate Athlete® course by the Johnson & Johnson Human Performance Institute. It utilizes a multi-disciplinary approach built on the sciences of performance psychology, exercise physiology and nutrition to create lifelong behavior change via integration of the employee’s personal mission with their spiritual, mental, emotional and physical well-being.

Our commitment to employee health and well-being has a proven return on investment with demonstrated links to improved market performance.¹ Through robust participation in these programs — with more than 90 percent of our global population

¹ 2009 dollars; (2011 Health Affairs, Henke); “Do Workplace Health Promotion (Wellness) Programs Work?” (JOEM, 2014); “The Link between Workforce Health & Safety and the Bottom Line” (2013 JOEM, Fabius)

participating in a personal health risk assessment in 2015 — many employees have made meaningful reductions in rates of obesity, high blood pressure, high cholesterol, tobacco use, physical inactivity and poor nutrition.

Outcomes

Energy for Performance® training is a key employee health strategy built to empower employees to achieve their personal best — in health and well-being. This training was developed by the Johnson & Johnson Human Performance Institute and is available to all employees through a partnership with Johnson & Johnson Global Health Services.

A retrospective study² on the Energy for Performance® training was conducted using quasi-experimental matched-control design. It evaluated key findings during 2009 – 2015 from 9,612 U.S.-based full-time employees of Johnson & Johnson. The study findings were initially presented by Jack Groppe, PhD, at the Health Enhancement Research Organization annual conference in 2016.

Performance



Employees who completed the longer duration Energy for Performance® course were associated with an **18 percent higher likelihood of receiving a top rating the following year**. The relationship between the 2.5-day course and employee performance was almost 2.5 times greater than that of the one-day course. The half-day course did not produce statistically significant employee performance outcomes.

Retention & Promotion



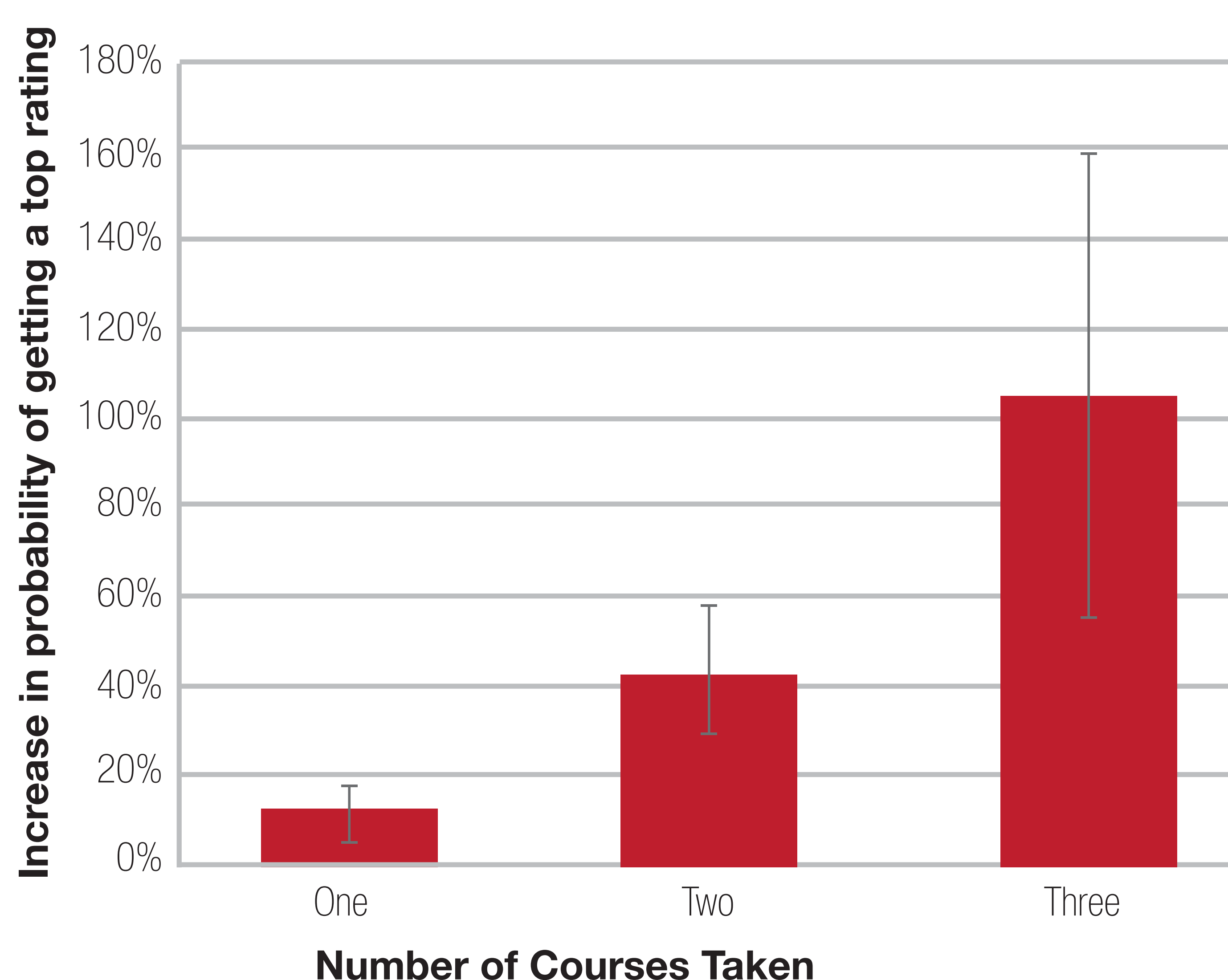
Energy for Performance® graduates were significantly more likely to stay at Johnson & Johnson over the six-year period studied. We also found that participation in the Energy for Performance® course was associated with a **25 percent higher likelihood of receiving a promotion** — defined as an increase in pay grade — in the year following course completion.

Length of Course and Enrolling Multiple Times



The greatest impact is associated with longer classes and taking the class multiple times — showing increased employee performance and retention of these higher performing employees. There were also high levels of self-reported employee satisfaction; 92 percent of course graduates stated they were 'Likely' or 'Extremely Likely' to make significant life changes using what was learned during the training.

Taking multiple Energy for Performance® courses was associated with increased performance



*Adjusted by previous performance, sector, pay grade, and function

**Error bars are standard error of relative risk

***Performance and number of courses taken n's: Zero=4807, One=4395, Two=373, Three=35

Source: Alec Munc, PhD, Adam Myer, PhD (2016) Energy for Performance®: Evaluation of Course Impact with Johnson & Johnson Employees. Findings presented by Jack Groppe, PhD, at Health Enhancement Research Organization annual conference, 2016.

² This study found an association, it does not support claims of causation. The rigor for causation cannot be addressed with this study.

Implications for Johnson & Johnson employees and leaders

- The Energy for Performance® course is associated with increased employee performance and retention and makes a compelling case to provide access to training for most Johnson & Johnson employees.
- The greatest impact is associated with longer classes and taking the class multiple times, indicating a need to sustain energy management training for employees and providing a supportive environment beyond the initial training.
- Findings from increased employee retention translates to an estimated savings from reduced turnover costs of \$60 million for the 30,000 trained to date and \$200 million when the 2020 goal of training³ all 100,000 employees is reached and assumes the average Johnson & Johnson salary.

“ One of the things that I really need to work on even after having gone through Corporate Athlete [Performance] was managing my own stress level. Now, when I encounter those stress events that are inevitably going to happen – I now have another tool that I’m going to be able to use in managing through those events and perform at a high level. ”

– J&J Human Performance Institute Corporate Athlete® Graduate

What’s Next?

In 2017, we launched the Corporate Athlete® Resilience training course, working with Dr. Jim Loehr, co-founder of the Johnson & Johnson Human Performance Institute, to design the framework for the course, leveraging principles of Corporate Athlete®. His work has supported individuals in high stress environments to build resilience and sustain high performance for more than 30 years. Dr. Loehr worked with Johnson & Johnson to understand the primary components of resilience, define resilience, and integrate resilience into our Human Performance Institute’s unique change model. Foundationally, the course helps individuals train every day to build resilience. It is a course that re-defines stress as an opportunity for growth and explores the science of recovery to provide individuals with practical tools to help them become more resilient, perform at their best and live their most meaningful life — even in the face of uncertainty and high stress. The course was developed in response to feedback from Corporate Athlete® graduates and truly addresses the upward trend of burnout in the workforce.

We believe that the Corporate Athlete® Resilience is different than other resilience programs because it uniquely focuses on the whole person – exploring resilience in the physical, emotional, mental and spiritual dimensions. In addition, we believe that a positive stress mindset, strategic recovery, a connection to purpose are the tools that help build resilience over time. Many other resilience programs only focus on emotional or mental resilience. Also, Corporate Athlete® Resilience helps individuals leverage stress for growth rather than avoid or minimize stress. This program provides practical techniques that anyone can use every day to train to build their resilience.

In the Corporate Athlete® Resilience program, resilience is defined as the ability to recover, adapt and grow from stress. Redefining stress into three unique categories – normal, training, excessive – can support strategic recovery as a resilience training technique and connect to purpose to motivate continuous training to build resilience and sustain high performance. We want participants to walk away from the program with the tools and techniques to help them create a positive stress mindset, improve the balance between stress and recovery in their life, and connect more deeply to their purpose because we believe that these are three drivers that contribute to improved resilience.

Together, we’ll create healthy habits that can help us stay mentally focused, purpose-driven and resilient to the daily stressors.

³ Center for American Progress, Boushey, Heather and Sarah Jane Glynn, “There are significant business costs to replacing employees” 2012.

CASE STUDY: KKR

Background

KKR is a leading global investment firm that manages multiple alternative asset classes, including private equity, energy, infrastructure, real estate, credit and, through its strategic partners, hedge funds. Founded in 1976, as of June 30, 2017, KKR has a team of approximately 1,250 employees, consultants and senior advisors, including approximately 370 investment professionals working across 16 industries in offices around the world.

KKR's commitment to providing healthcare and wellness opportunities for employees is evidenced by the internal brand, KKR Wellness Works. Through this initiative, KKR facilitates biometric screenings and flu shots for U.S.-based employees. Those demonstrating a health risk also receive wellness coaching and health management support. Additional offerings include health risk assessments, cancer screenings, CPR training, and support for physical activities, including gym membership reimbursement, as well as walking and running events.

Committed to providing comprehensive and forward-thinking options, in 2014 KKR hired a global head of benefits to provide leadership in this area. In 2015, KKR relaunched Wellness Works heralded with a desk-drop of pressed juices, sweat bands, and a speaker event with renowned performance physician Dr. Jordan Metzl and hosted by co-CEO Henry Kravis. As part of this relaunch, KKR adopted an iterative approach to fostering employee wellness and resiliency, integrating wellness activities, methodologies, and information relevant to the many demographics and constituencies who comprise its employee base.

Resilience Program

Under the proactive vision of co-CEO Henry Kravis, Chief Administrative Officer Todd Fisher, Chief Talent Officer Joan Lavin and Global Head of Benefits Christopher Kim, collaborative analysis of emerging science and trends in wellness, corporate culture and executive performance led to a desire to build the resiliency of the KKR workforce. As KKR's first firm-wide foray into actively cultivating employee-oriented programming, the stakeholders agreed the concepts had to be introduced in an iterative, ongoing flow of information and experiences infused throughout the culture.

One of the biggest challenges to fostering employee resiliency is being able to prioritize actions that support well-being. Our approach has therefore been to integrate thoughtful touchpoints throughout the work experience in which employees receive prompts to shift behaviors that impede resiliency. Focused upon both cognitive aspects such as brain function (problem solving, creativity, clarity), as well as immune and emotional function, topics include: time management, stress management, meditation, sleep hygiene, nutrition, exercise, restorative activities, and therapeutics. The expected outcome has been to both provide resources to support employee resiliency, as well as drive likelihood for employees to proactively integrate life-enhancing choices and behaviors. Key tactics have included the following:

- i. Socialize a culture of well-being exemplified by these concepts as measures of success at KKR and a key driver of professional excellence.
- ii. Normalize proactive self-care as the discipline of champions to generate receptivity, ongoing participation, improvements in cultural and biometric benchmarks.
- iii. Employ a mix of distribution methods for these messages to include everyone in the conversation about choices and performance.

KKR's preparation to develop and implement a resilience program included analysis of best practices at peer organizations, understanding historical initiatives that support employee well-being, interviews with keepers of institutional knowledge, interviews with key strategic providers and vendors for their insights and knowledge about firm appetite/culture with respect to resiliency and well-being, and generating buy-in from key stakeholders among executives.

Employee touchpoints have included desk drops, book giveaways, panel discussions, speaker events with published experts, drop-by participatory learning events, classes, themed series, a rest and recovery room, annual health challenges, 1:1 wellness coaching, and cohort-based wellness intensives. Each element was curated and offered to warm the culture to concepts of resiliency as being relevant not only to quality of life, but also to work performance. Establishing a context of sustainable success as an underpinning to performance at KKR, the goal was for resiliency-enhancing choices and practices to gain traction through Wellness Works offerings and on one's own.

Conveying performance and resiliency as a cultural priority, evolutions include:

- A dedicated rest and recovery room including an EXOS Performance Kiosk
- Musculoskeletal/ergonomics programming
- Meditation series
- Challenges including “step,” nutrition, hydration, sleep, meditation, family-time, philanthropic and physical activity elements
- Learning events addressing resiliency, sleep, nutrition, fitness, musculoskeletal
- The Incubator Wellness Immersion
- On-site screenings beyond typical biometrics (i.e.. skin cancer, vision, oral care)
- 1:1 onsite wellness coaching (double certified Registered Dietitian / Personal Trainer)
- Tough Mudder team sponsorship
- Community Supported Agriculture (CSA) program sponsorship
- Outdoor gatherings including kayaking on the Hudson, Central Park workouts and runs.

We applied a matrix of criteria including strength of evidence, depth of experience, cost-effectiveness, focus upon behavior change, adaptability to customize to fulfill KKR's vision, and propensity to generate a “wow” factor among employees.

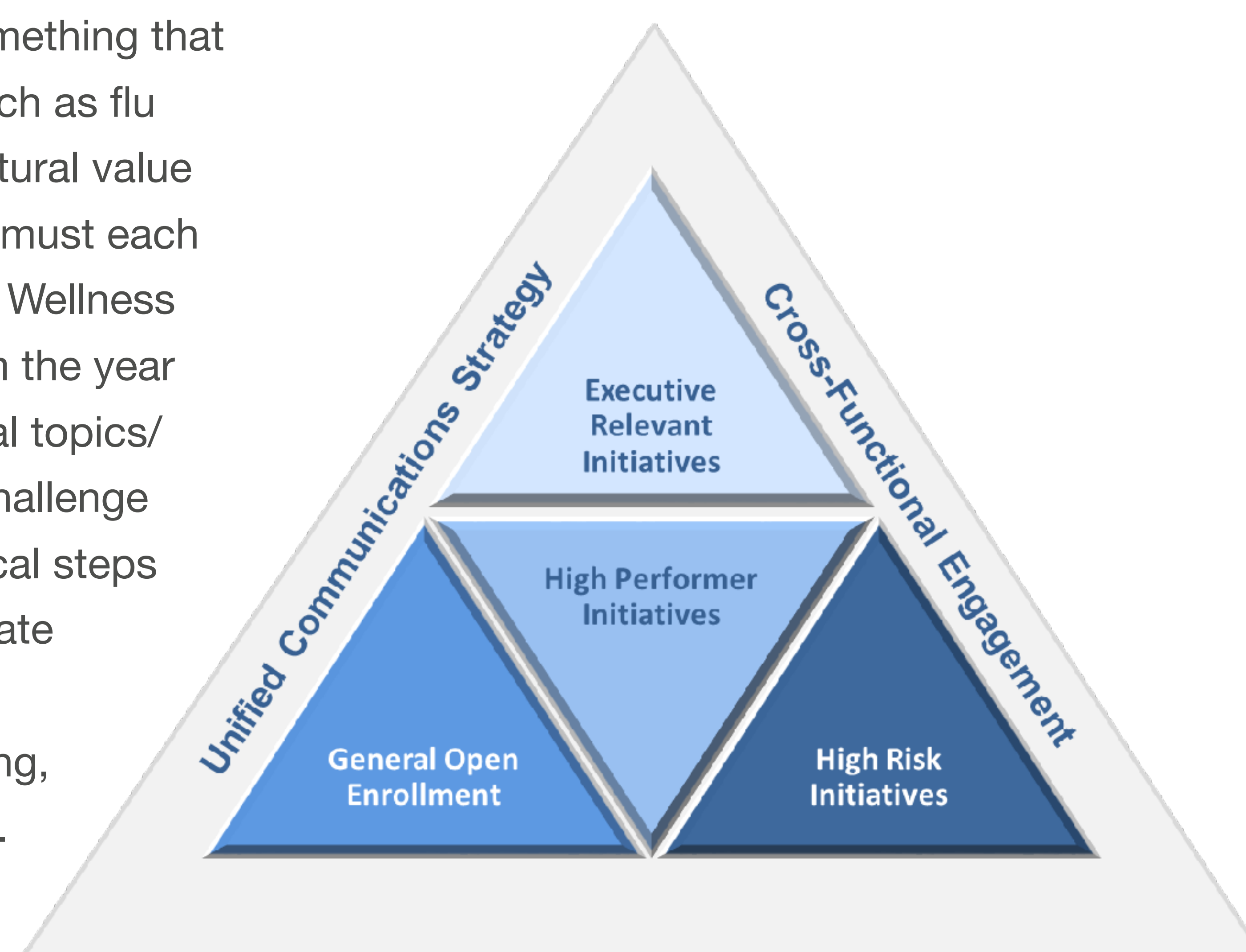
As our approach was integrative and designed to intertwine the concepts of resiliency throughout the employee experience rather than existing as a siloed offering, the program was developed in-house with support from strategic consultancy Balance Integration who helped to leverage both existing and outsourced elements and resources with incremental programs and messaging. Our rationale: as resiliency is a driving factor in the success of the firm, it is a topic of ubiquitous importance and so content delivery must also be pervasive.

As we worked to infuse resiliency throughout KKR, we considered both the breadth of demographic and psychographic constituencies comprising our employee base, and also how they relate to the following chart:

Each programmatic element contributed to our continued evolution. Four years in, it is clear that utilizing overt competition/ challenges is a key driver of adaptation and socialization of resiliency concepts and behaviors. Best practices embodied in those offerings include sleep hygiene, restorative activities, meditation, exercise, whole foods and healthful hydration.

This program is unique in that it champions resiliency as a firm-held value rather than relegating it to wellness, human resources or benefits.

From pre-2014 positioning of employee well-being as something that can be addressed through purely clinical interventions such as flu shots and biometrics, the underlying innovation is the cultural value held by leadership at KKR that to perform at our best we must each be attentive to being our best. Additionally, each year the Wellness Works team evolves offerings based upon outcomes from the year before, and indicators of cultural receptivity to incremental topics/ behavior shifts. An example of this is “Head Games,” a challenge we offered in 2016 which was a clear break from the typical steps challenge. “Head Games” called on participants to integrate mindfulness and sleep practices into their lives. Activities included sleep hygiene, meditation classes, activity logging, MP3 meditations, and a talk by a renowned sleep expert.



Outcomes

The expected outcome has been to both provide resources to support employee resiliency as well as drive employee likelihood to proactively integrate life-enhancing choices and behaviors. The desired benefits to the firm include greater productivity, reduced claims, nurturing a culture of well-being and resiliency that is more attractive to existing and potential employees, and increasing effectiveness of daily business operations.

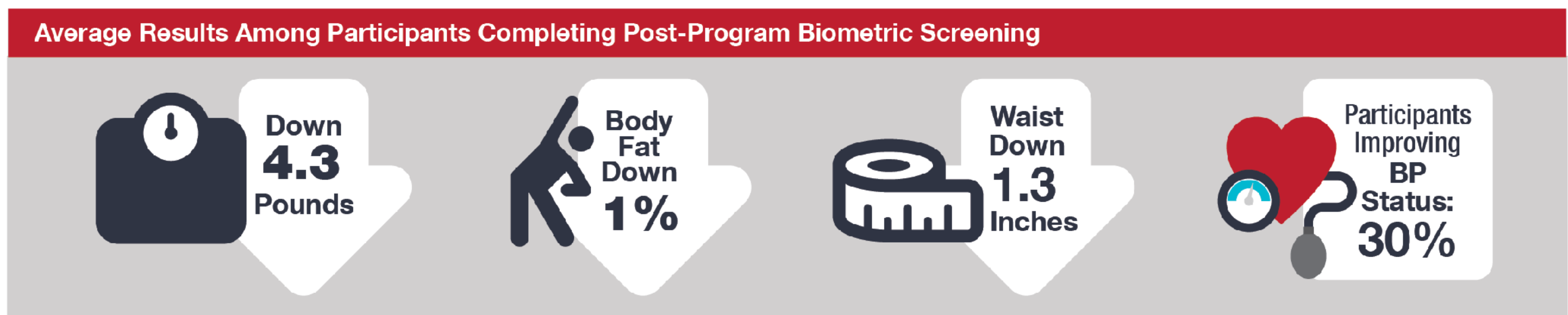
KKR used participation, post-offering surveys, self-assessments, biometrics, sustained utilization by constituencies throughout the population and consultation with Wellness Works Ambassadors (i.e., employees passionate about supporting wellness at the firm) to measure implementation and effectiveness success. In terms of touchpoints and participation, with the genesis of the relaunch in late 2014, by 2015 we measured 1,061 actual touchpoints (employees consuming information or coming to an event). In 2016, we measured the following accomplishments:

- Positive Impact - 85%-100% of attendees “recommend attending” programs to other employees. As offerings expand, the brand has become trusted and participation continues to increase.
- Powerful Reach - 16,814 communication touchpoints and 8,008 participation touchpoints across multiple levels, many functions within KKR.
- Launch of Wellness Works Ambassadors Program - 25 program champions nationwide, providing input and support.

Given the success of these initiatives, the programs have been expanded to global offices.

Our ability to capture unique health improvements directly correlated to a program offering is demonstrated through our wellness immersion, The Incubator. Piloted in 2016 to a group of 30 employees, the following improvements were measured across the 67% of participants who completed both pre- and post-program biometric screenings:

- Average weight loss of 4.3 lbs.
- 1% average reduction in body fat
- Average reduction in waist circumference of 1.3 inches
- Approximately 30% of participants improved their blood pressure status



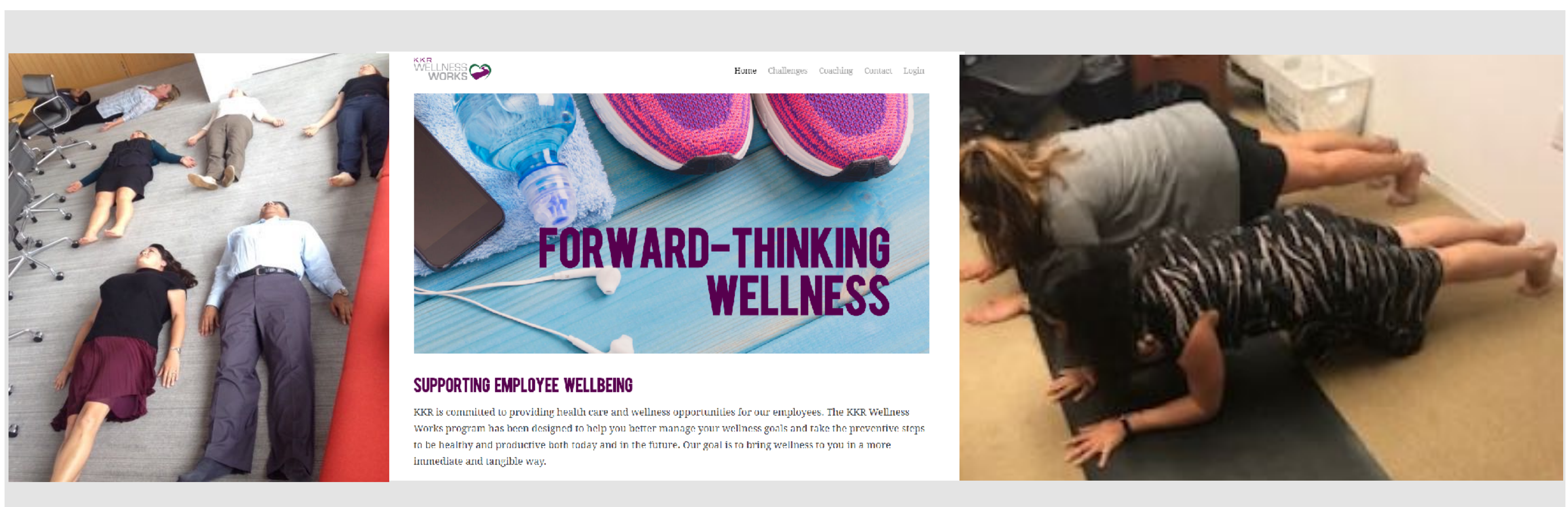
Testimonials provided evidence of self-reported improvements in productivity through open-ended options in post-program surveys.

Sample responses are in answer to **“How has participating in the Incubator program enhanced your work productivity?”**

- *“Understanding how to walk away or breathe when my boss drives me crazy will enable me to work better. I used to let it stew, but realizing that was a poor way to deal any issues.”*
- *“I was able to learn how to be more focused.”*
- *“Being more mindful of my habits and productivity.”*
- *“I feel more confident about my health which lets me focus more on work. I also feel better energy-wise!”*
- *“...I wanted to mention how beneficial I found it on so many levels. I went into it thinking it was mainly for weight loss, but feel the realization on stress triggers and ways to deal may be the greatest take-away for me. Looking forward to continuing to evolve and use everything I’ve learned!”*

What’s Next?

In 2018, we will offer a resiliency intensive specifically to our high performer population as both a test run for expanding to all professionals, as well as intelligence gathering for specific aspects of resilience cultivation (time management, meditation, nutrition, sleep hygiene, cognitive intervention, exercise, restorative activities). This program will be a six-week curriculum combining cohort learning and 1:1 coaching, and will be measured using psychographic self-assessment and biometric benchmarks. Additionally, we will pilot 1:1 coaching in locations throughout the U.S., and continue to expand meditation offerings to all populations.



Company Background

This Fortune 50 media and technology company employs approximately 100,000 people nationwide. The enterprise is heavily comprised of call centers and technicians, but also includes corporate workers as well. The company prides itself on its innovative efforts and providing its employees with the best benefit packages available. The company provides a variety of offerings from medical and dental plans to childcare resources as a way to best support its employees.

Resilience Program Background

In 2013, the company was experiencing chronically high absenteeism rates among its call center staff. After completing follow-up surveys with these workers, the company discovered that stress was identified as the main cause for these absences, and was an area in which employees needed the most assistance. While existing programs such as EAP, yoga and meditation were helpful, participation rates were low. The company needed a scalable solution to assist its employees.

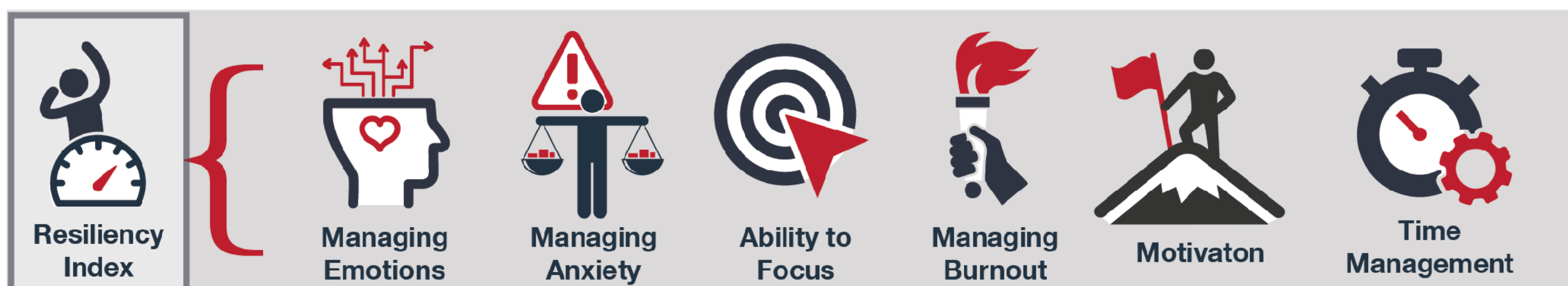
The company decided to implement a digital resilience training program from meQuilibrium. Resilience is the ability to quickly recover from adversity, as well as the capability to navigate difficult day-to-day conditions and thrive and persevere in the face of ongoing challenges. Scientific studies indicate that resilience is a skill that can be learned and refined. Developed by a team of experts¹, meQuilibrium builds, delivers and supports clinically validated resilience programs. Its analytics are driven by proprietary algorithms, and its cloud-based solutions are tailored to meet each user's needs and designed to be a universal, scalable, convenient and effective way to drive transformation. A third-party validation study conducted by Dr. Wendy Lynch, Ph.D., found that the meQuilibrium resilience measurement corresponds to other validated instruments in ways that confirm its construct validity. Additionally, the study concluded that resilience as measured by meQuilibrium is associated with many important business outcomes including absence, productivity, anticipated turnover, job satisfaction and net promoter.

meQuilibrium gets at the root cause of stress by addressing ineffective “thinking styles” – habitual thoughts and feelings that are often mistaken or negative, and which can unconsciously drive unhelpful behaviors. The meQuilibrium program empowers users to identify problematic thinking styles and then change or navigate around them. By combining behavioral psychology, neuroscience and analytics, the meQuilibrium program provides a detailed roadmap to personal and professional growth.

Before launching, meQuilibrium hosted a training with human resource leadership and call center management to obtain buy-in. The program was then launched company-wide through a comprehensive campaign employing a number of communication methods to encourage employees to participate:

- **Emails, posters and flyers**
- **On-site events such as benefits fairs**
- **In-house television channel including testimonials from users**
- **Existing company newsletter and in-home mailers**

The program began with an individual assessment to establish a baseline and identified sources of stress. This assessment generated an individualized Resilience Profile, which includes an overall resilience score, the meQ Score. The meQ Score is correlated with six key measures of lifestyle behavior and productivity that together are referred to as the Resilience Index. This Resilience Index is made up of known indicators of resilience, including managing emotions, managing anxiety, ability to focus, managing burnout, motivation, and time management.



An individualized action plan was then created for each user based on the results of the science-based assessment. This personalized journey guides the users through computer-based cognitive behavioral therapy, which is deployed through skill building exercises. The journey typically includes 12-18 skill bundles consisting of learning modules, activities, and relevant blog posts. The learning module within each skill bundle takes approximately 5-10 minutes to complete and includes multi-media elements such as videos, interactive tools, and activities to help users learn and absorb key concepts. Users participate in ongoing activities and read Cup of Calm blogs on related topics to help them practice and apply what they have learned as well as develop new more resilient habits over time. As meQuilibrium is a self-paced program, developing these new habits may take anywhere from three weeks to a few months. Engagement was sustained through behavioral-driven emails designed to motivate and reinforce key concepts in an accessible, positive style. Progress was tracked throughout the self-paced program and was reflected on a personalized dashboard.

Key Strategies

The company has a strong commitment to helping its employees have access to healthcare and a variety of well-being and healthy lifestyle programs as it believes there is a direct connection between employee health, well-being and work performance. The company chose a resilience program to not only help employees manage their stress, but to also promote healthier behaviors. Resilience can optimize health, productivity and life satisfaction.

Outcomes

Current overall results show substantial reductions in stress and improved performance, with resilience scores increasing by 8%. Changes in stress, performance and resilience indicators are determined by comparing responses to questions from the baseline assessment against responses provided throughout the training program. Resilience indicators include managing emotions, managing anxiety, ability to focus, motivation, managing burnout, and time management. Just as steady exercise is necessary for maintenance of your physical body, the training program is designed to be ongoing to allow users the opportunity for continuous mental improvements.

The employees who engaged most with the program saw a notable benefit in the reduction of absenteeism. In addition to the data collected within the program, the company also provided data on leave usage both prior to training implementation and after on a small scale sample. In this sample, those who completed the initial sequence of four training skills (N=330) had substantially reduced usage of intermittent (-1.5) and continuous Family Medical Leave Act (FMLA) days (-0.8) than users who completed the assessment but did not complete the four skills. Based on this small sample, the company is estimated to save \$3 million on the overall population as a result of the increase in resilience scores.

As a result of these positive results, the company started to include the meQuilibrium training as part of its new employee onboarding and training process earlier this year. The company recently renewed a long-term contract for the program and has also expanded offerings to incorporate the leadership training module as well.

“ Current overall results show substantial reductions in stress and improved performance, with resilience scores increasing by 8%.... Based on this small sample, the company is estimated to save \$3 million on the overall population as a result of the increase in resilience scores. ”



¹Prior to founding meQuilibrium, Jan Bruce was managing director and publisher at *Martha Stewart Living's WholeLiving.com/body+soul* magazine. Earlier she served as CEO and cofounder of the Integrative Medicine Communications, the leading digital brand in science-based complementary medicine. Andrew Shatté, Ph.D., founder and president of the training and consulting company Phoenix Life Academy, is a leading expert in resilience and how to boost it. He is a fellow at the Brookings Institution's Center for Executive Education and currently serves as a research professor in the College of Medicine at the University of Arizona. Adam Perlman, M.D., M.P.H., is a recognized leader in the field of integrative medicine and a respected researcher and educator in the field of complementary and alternative medicine and wellness. In 2011, he became the executive director for Duke Integrative Medicine.

5. HOW CAN THIS BE APPLIED?

The current body of evidence on resilience, complemented by findings from the employee survey and case studies, suggest resilience training programs may have some benefit. Also, it highlights the need for further research and dissemination of findings of programs that work, and those that do not. Fortunately, the body of evidence continues to grow.

The organizations that have provided case studies for this report are not only innovating and role-modeling comprehensive approaches to build resilience and improve health among employees, but they are also contributing to the available knowledge on this topic that other organizations can review and consider applying in their workplaces.

Table 1 on Page 5 provides a summary of key strategies for employers to consider as they embark on designing, implementing and evaluating a resilience training program or look to strengthen their current program. These are extracted from the current body of evidence on resilience, findings from the employee survey and the case studies.

A Comprehensive, Systems-Based Approach

As indicated in the Introduction of this report, the scope of this paper centers on individual-level interventions to improve employee resilience. Furthermore, the literature review of studies published between 1990 and 2014 did not yield an organization-level intervention. In addition to resilience training programs aimed at individuals or groups of employees, organizations should also consider organizational level interventions to address job strain and other work conditions that are associated with stress. These strategies might include, but are not limited to, making changes in work flows and practices, goal-setting/productivity expectations, requirements to be online and available even when off duty, unscheduled mandatory overtime and short notice of upcoming shift schedules. In some instances, addressing these issues may be more efficient and cost-saving. For example, organizational level interventions focused on increasing employee job control, decreasing job demands and increasing support^{100,101} have been associated with health benefits, including reduced anxiety and depression, as have interventions that restructure work tasks to reduce job stress.¹⁰⁰

Although it was out of scope to fully address organizational level strategies within this report, we want to call noteworthy examples of these strategies among our case studies. All our case studies companies highlight resilience training programs offered as part of broader initiatives to reduce job strain and prevent and reduce the negative outcomes of stress. For example, as part of KKR's iterative approach to fostering employee wellness and resiliency, in addition to wellness activities and programs, KKR's policies and work environment evolved on many fronts including improvement in the healthfulness of catering provided to employees and executives, ergonomics initiatives, designation of a rest and recovery room and encouraging employees to integrate exercise into their workday. In another example, Deloitte implemented a multi-pronged approach, including time for people to disconnect and recover, programs that can support a range of life events, leaders involved in communicating, role-modeling and encouraging positive behaviors, in addition to education and resources on effective stress management strategies.

Each case study describes a variety of strategies that were implemented as part of a wider approach to address resilience, health and well-being.

6. WHAT DO WE STILL NEED TO KNOW?

This synthesis of existing scientific evidence on resilience and resilience training programs has highlighted limitations and opportunities for future researchers to address are summarized in Table 7.

Table 7. Suggested Recommendations for Future Research

1. Defining and measuring resilience

- Researchers should ideally use a consistent definition of resilience to enable better cross-comparisons between programs and their observed effects.⁷
- Developing a consensus statement on defining workplace resilience would allow researchers to make comparisons across studies.
- Half of the studies in the sample explicitly defined resilience and approximately four in 10 studies measured resilience directly as an outcome. Researchers are encouraged to explicitly measure resilience so the effectiveness of these training programs on resilience itself can be better assessed.

2. Intervention design and quality

- Researchers should ideally use randomized control trials to reduce the risk of bias.
- In a practice setting where randomization is often not feasible, researchers should focus on creating matched comparison groups using recommended statistical methods.
- Researchers and practitioners are encouraged to replicate studies with demonstrated effectiveness to increase generalizability.
- The average sample size was relatively small, which limits sub-group analysis. Future studies would benefit from using larger sample sizes to detect more subtle group differences.¹²
- Few studies were conducted in ethnically diverse workforces, and there was a clustering of studies in specific settings that are not generalizable to most workplaces. Future studies would benefit from testing programs in more diverse settings to improve generalizability and to help create more customized solutions for different populations.¹²
- It is unclear which elements of resilience training programs are the most effective. Therefore, future research would benefit from determining which specific elements and processes are the most predictive of building resilience.¹⁶
- Little is known about the function of time from a stressful event to recovery time. Researchers should continue to examine the role of time in resilience to better guide practitioners.¹⁷
- Little is known about the different levels of resilience that can be achieved in high-performing versus low-performing organizations. More research is needed to understand how organizational context and climate effect individual (and organizational) resilience.²²

3. Theories of change

- More research is needed to compare different types of programs.²¹

4. Implementation Characteristics

- Many studies did not provide adequate information on how the intervention was implemented. To better understand how implementation features influence program effectiveness, researchers are encouraged to provide a more detailed description of the implementation context and process measures.

5. Outcomes Reporting

- Few studies included a table that described participant demographics and other variables for both treatment and control groups. Researchers are encouraged to report these data comprehensively and consistently using recommended guidelines.
- Very few studies reported long-term outcomes. Longer follow-up periods are necessary to test the durability of resilience programs.^{12,16}
- Few studies measured and reported physical health outcomes. Given the bidirectional relationship between mental and physical health, future research would benefit from including well-established risk factors that increase risk of poor health that would negatively impact resilience (e.g. tobacco use, physical inactivity, poor diet, unhealthy weight and high blood pressure).³⁸
- Most studies used self-reported measures. Where possible, researchers should consider incorporating more objective measures to study their outcomes. For example, numerical training performance grades could assess levels of performance.¹⁶
- Researchers should consider potential harms of resilience training programs, and report any observed harms. This will help inform program design that increases the benefit of these psychological interventions.
- No study in the sample reported on program costs, or provided an economic analysis such as cost-effectiveness. Employers, purchasers of programs and policy makers need more information on comparative cost-effectiveness to guide decision-making when investing in these types of programs.

Source: Adapted from Robertson (2015) and Britt (2016). Supplemented from individual articles and the assessors' interpretation of the data.

CONCLUSION

The current body of evidence suggests resilience training programs appear to have a modest effect on resilience at the individual level. Evidence on systemic or organizational-level policies and practices that promote resilience is currently very limited. This finding is from a promising workplace literature, which would be strengthened if study results of effective programs can be replicated in different settings and different populations. The results from the national employee survey underscore the potential value of these programs to employees and provides guidance on how employers can encourage participation. The case studies indicate that employers are using innovative approaches in the field, including creating cultural change through organizational policies to create a supportive environment where employees can rest and recover.

Based on these findings, this report provides practical tips and preliminary suggestions for employers on how to design, implement and evaluate a resilience training program.

Future research is needed to further investigate the effectiveness of resilience training programs and to understand the mechanisms through which resilience leads to health and work performance outcomes. The growing research demonstrates a keen interest in investigating the effectiveness of these programs within the workplace setting. As employers design new resilience training programs and organizational practices or strengthen existing programs and practices, we encourage employers to develop evidence-informed programs, and to publish results to help close current knowledge gaps between research and practice.



APPENDIX A. METHODS

We used three approaches (literature synthesis, national survey and selected case studies) to investigate the effectiveness of resilience training programs to provide insight from different stakeholder perspectives: researchers, employees and employers. This multi-pronged approach was designed to provide a more comprehensive understanding of the current science, practice and employee perceptions of these programs.

Literature Synthesis

We originally set out to conduct a formal systematic literature review on resilience programs in the workplace between 1990 to the present. Our aim was to assess the effectiveness of these programs on a range of physical, mental health and work-related outcomes, such as productivity and job satisfaction. With support from an experienced medical librarian and with input from the CEO Roundtable Resilience Workgroup, we developed a detailed data search strategy (Appendix C). The search included key terms such as “resilience,” “emotional fitness,” “psychological stress,” “education,” “training support” and “workplace.”

During the data abstraction and screening phase, we identified four recently published reviews on this topic.⁷⁻¹⁰ Two reviews also conducted a meta-analysis,^{9,10} which is a quantitative analysis combining the results of different published studies to estimate the overall treatment effect of interventions. We also identified a published protocol for an updated systematic literature review, which is currently underway.⁹⁷ Given this discovery, we reached agreement with the Workgroup to modify the approach from conducting a formal systematic literature review to instead focusing on a **literature synthesis**, which is a concise summary of the findings from the four existing reviews.⁷⁻¹⁰ The purpose of the synthesis is to describe the current scientific body of evidence, document gaps in knowledge and recommend future directions for research and practice.

To complement findings from the four reviews,⁷⁻¹⁰ we identified and synthesized results from 28 independent randomized control trials¹¹⁻³⁸ (RCTs) from those four reviews. Although one review included non-randomized trials,¹⁰ we selected only RCTs because an RCT study design minimizes selection bias by randomly allocating participants to either the intervention or control arm. While we recognize that RCTs are difficult to implement in workplace settings, they are generally considered to be the gold standard in clinical trials and provide reliable estimates of the treatment effect.⁷¹ The benefits of alternative study designs and their statistical methods to reduce bias, are beyond the scope of this paper. Further, due to time constraints, we did not conduct a new meta-analysis using data from the 28 RCTs.

Two authors worked independently to extract data from these studies using a standardized data extraction form, which included an analysis of participant characteristics, program approaches and reported outcomes. Through consensus, a detailed Summary of Evidence Table (Appendix D) was produced. The authors extracted the Cohen’s d or Standardized Mean Difference statistic from the two published meta-analyses for the included studies. For those studies with no published Cohen’s d or Standardized Mean Difference statistical data, one author calculated a Cohen’s d and another author reviewed the result. The 95% Confidence Interval was used to assess whether results were due to chance or statistically significant. The Standardized Mean Difference (SMD) or Cohen’s d (Cohen, 1977) is a statistic used to compare the pooled or combined effect of all outcomes as measured by the difference between the mean difference between the treatment and control groups. One can interpret the size of the treatment effect using Cohen’s d, with values closer to 1 indicating larger differences in the outcomes between the treatment and control group as a result of the intervention:

0.20 ≈ **small** (1/5 of a standard deviation)

0.50 ≈ **moderate** (1/2 of a standard deviation)

0.80 ≈ **large** (8/10 of a standard deviation)

1.0 = (1 standard deviation)

Employee Survey Methods

The American Heart Association commissioned Harris Poll (formerly part of Nielsen) to conduct an online survey within the United States from July 31 – August 16, 2017 among a representative sample of 1,001 adults (age 18 and over) employed part or full time in organizations with 25 or more employees that offer a healthcare plan. Figures for age, sex, race/ethnicity, education, region and household income were weighted where necessary to bring them into line with their actual proportions in the population of full or part time employees.

‘Younger Millennials’ - employees **age 18-27** (n= 101)

‘Older Millennials’ - employees **age 28-36** (n= 189)

‘Gen Xers’ - employees **age 37-51** (n= 289)

‘Baby Boomers’ - employees **age 52-70** (n= 359)

‘Matures’ refers to employees age 71+ (n= 63)

Please note: *The sample size for Matures is less than 100. Results for this group is directional in nature.*

In addition to examining differences across generational groups, differences across groups by social factors associated with health were examined, including income and educational attainment.

Lower income groups were defined as individuals with household incomes of less than \$50k annually (n=276).

Higher income groups were defined as individuals with household incomes of \$50k or more (n=666).

Educational attainment groups included:

Individuals with a high school degree or less (n=103)

Individuals with more than a high school education (n=898)

All sample surveys and polls, whether they use probability sampling or not, are subject to multiple sources of error which are most often not possible to quantify or estimate, including sampling error, coverage error, error associated with nonresponse, error associated with question wording and response options, and post-survey weighting and adjustments. Therefore, we avoid the words “margin of error” as they are misleading. All that can be calculated are different possible sampling errors with different probabilities for pure, unweighted, random samples with 100% response rates. These are only theoretical because no published polls come close to this ideal.

Respondents for this survey were selected among those who have agreed to participate in online surveys. No estimates of theoretical sampling error can be calculated.

APPENDIX B. MEASURING RESILIENCE

To know whether a resilience training program is successful in achieving its stated goal of building and maintaining resilience in the workforce over time, it is vital to measure resilience using tools that have been evaluated for reliability and validity across multiple studies. Reliability refers to the extent to which an instrument produces consistent results over time. Validity refers to how accurately the instrument measures what it is intended to measure. A good resilience measurement tool will have adequate evidence of both reliability and validity properties.¹⁰²

Our review found that there are a variety of instruments used to measure resilience in individuals in a variety of settings. Overall, there is no consistent approach to measure resilience.⁹ A few validated measurement tools are sufficiently brief to easily integrate into a workplace administered health risk assessment (HRA).

Appendix Table 1 below lists six resilience measures. The first three are from an evaluation study that assessed the quality of resilience instruments related to their reliability and validity properties.¹⁰² **Overall, the Connor-Davidson Resilience Scale⁷⁸** (CD-RISC; 25 questions), the **Resilience Scale for Adults¹⁰³** (RSA; 37 questions) and the **Brief Resilience Scale¹⁰⁴** (BRS; 6 questions) received the highest quality ratings, demonstrating their potential to detect clinically important change.

Two additional tools – the **Resilience at Work Scale (RAW) scale¹⁰⁵** and the **Workplace Resilience Inventory¹⁰⁶** – are listed, because they have been designed specifically for the workplace setting. However, both tools are relatively new and require additional testing to demonstrate reliability and validity. Nevertheless, it may be useful to consider using or adapting these tools because they focus on the amenable skills that employees can build over time to become more resilient specifically in the workplace.

Finally, we list the **Predictive 6-Factor Resilience Scale (PR6; 16 questions)¹⁰⁵**. This instrument builds on validated resilience scales, including the CD-RISC and RSA scales. It conceptualizes five psychological resilience domains and includes a sixth domain related to physiological health, which recognizes that being physically active, eating healthy and having good hygiene are strongly correlated with being resilient.¹⁰⁷ The PR6 has demonstrated some promising evidence of reliability and validity, but further use and testing are needed.^{107,108}

Appendix Table 1. Selected Resilience Measures

Instrument Name	Purpose of the Measure
<p data-bbox="318 1879 760 1964"># of Domains (Questions); Proprietary or Publicly Available</p> <p data-bbox="286 2022 891 2116">The Connor-Davidson Resilience Scale⁷⁸ (CD-RISC)</p> <p data-bbox="323 2139 476 2224">5 (25) Proprietary</p>	<p data-bbox="995 1902 1836 1987">Developed for clinical practice as a measure of stress coping ability. It measures 5 factors, including:</p> <ul data-bbox="995 2002 1699 2230" style="list-style-type: none"> • personal competence • trust/tolerance/strengthening effects of stress • acceptance of change and secure relationships • control • spiritual influences
<p data-bbox="286 2321 733 2407">The Resilience Scale for Adults (RSA)¹⁰³</p> <p data-bbox="323 2430 476 2516">5 (37) Proprietary</p>	<p data-bbox="995 2301 1836 2430">Examines intrapersonal and interpersonal protective factors presumed to facilitate adaptation to psychosocial adversities, including:</p> <ul data-bbox="995 2444 1345 2658" style="list-style-type: none"> • personal competence • social competence • family coherence • social support • personal structure

(Continued)

<p>The Brief Resilience Scale¹⁰⁴</p> <p>1 (6)</p> <p>Publicly Available</p>	<p>Assesses the ability to bounce back or recover from stress.</p>
<p>Resilience at Work Scale¹⁰⁵ (RAW)</p> <p>1 (20)</p> <p>Proprietary</p>	<p>Assesses resilience within the work environment as a skill that can be taught, practiced and developed. It includes:</p> <ul style="list-style-type: none"> • living authentically • finding one's calling, i.e., having a sense of purpose • maintaining perspective • managing stress • interacting cooperatively • staying healthy • building networks
<p>Workplace Resilience Inventory¹⁰⁶ (WRI)</p> <p>4 (20)</p> <p>Publicly Available</p>	<p>Measures four factors of resilience based on protective factors, including:</p> <ul style="list-style-type: none"> • active problem-solving, including active coping • team efficacy • confident sense-making • bricolage, which is the ability to fashion solutions creatively to address the situation
<p>Predictive 6-Factor Resilience Scale¹⁰⁷</p> <p>6 (16)</p> <p>Proprietary</p>	<p>Developed from an analysis and comparison of existing scales, including CD-RISC and RSA, the PR6 measures interpersonal and intra-personal factors are adapted into five domains of psychological resilience:</p> <ul style="list-style-type: none"> • vision, i.e., self-efficacy and goal setting • composure, i.e., emotional regulation • tenacity, i.e., perseverance and hardiness • reasoning, i.e., problem solving, resourcefulness • collaboration, i.e., support networks, secure attachment <p>These are complemented by a sixth domain related to physiological health that measures:</p> <ul style="list-style-type: none"> • physical health • nutrition • sleep hygiene

WE RECOMMEND THAT DEVELOPERS:

1

Use a measurement tool that has been assessed for adequate reliability and validity across multiple studies. If a vendor uses a proprietary tool not discussed in peer-reviewed literature, employers should consider asking for data and analysis that demonstrates reliability and validity.

2

Use a tool designed to measure resilience specifically within the workplace setting. Keep in mind that the newer instruments may be lacking in reliability and validity testing compared to older resilience measurement tools. Ideally, ascertain reliability and validity for the tool prior to including it in an evaluation.

3

To ensure accurate measurement and tracking over time, include the same questions at each assessment, with additional questions as needed. If additional items need to be included, it is better to add questions, rather than revise or replace them. This allows for a fairer assessment of changes and supports the ability to interpret changes as a result of the intervention.

4

Consider using a measurement tool or combination of tools that not only assess the level of resilience and but also assess the resources and assets that might be present or missing that facilitate resilience (i.e., problem-solving skills, self-efficacy, social support, etc.). Using a tool that measures, not only the level of individual resilience, but also measures related constructs, can provide a better understanding of the resources and assets present among the workforce. The resulting gaps can inform the intervention design.

5

A brief measurement tool such as the Brief Resilience Scale may be more feasible to incorporate into a health risk assessment. However, note that this scale focuses only on the ability to bounce back and does not measure other resilience related assets, such as problem-solving skills, emotional regulation, sense of purpose, etc. Longer questionnaires that fully capture the additional traits can be administered depending on a company's resources.

6

Pilot your measurement tool before use to ensure that it will be favorably received by the target group and can be completed in a reasonable amount of time to enhance participation and minimize missing data.

7

Resilience may be culture specific. Ideally determine if the chosen measurement tool is appropriate for different sub-populations or conduct sub-group analysis when assessing resilience scores to detect any observable differences between groups.

APPENDIX C. LITERATURE SEARCH STRATEGY

Objective

To evaluate the effectiveness of work- and person-directed resilience training interventions compared to no intervention or alternative interventions to improve cardiovascular health, mental health and well-being outcomes in working-age adults.

PICOTS (Population, Intervention, Comparator, Outcomes, Timing, Setting)

Population: Working age adults 18-64 years

Intervention: Resilience training programs

Comparator: No intervention or alternative interventions

Outcomes: Primary outcome: cardiovascular health. Secondary outcomes: mental health, stress, sleep, quality of life, productivity, job satisfaction, absenteeism, presenteeism, job performance, job commitment, sense of purpose and adaptability

Timing: 1990-present. Rationale: Project timeline and resources do not permit a wider search.

Setting: Workplace/occupational setting

Note: Secondary outcomes are being refined.

Definition of Resilience

- The following definitions offer insight into certain commonalities of definitions of resilience.¹⁰⁸
 “The ability to recover from or adjust easily to change or misfortune”¹⁰⁹
 “The ability to withstand, recover, and grow in the face of stressors and changing demands”⁶
 “A set of conditions that allow individual adaptation to different forms of adversity at different points in the life course.”¹¹⁰

Definition of Definition of Resiliency and Resiliency Training Interventions

- Resiliency can be thought of as the process of achieving resiliency.
- Resiliency training programs or interventions “are a loosely defined group of interventions that systematically seek to enhance resilience in individuals or groups [or organizations]”⁹
- There currently is no single accepted theoretical framework or consensus statement to guide the development or applications of these programs.

Information Sources

In conjunction with AHA’s experienced research librarian, we will search the following electronic databases from 1990 to June 16, 2017: PubMed, Ovid Embase, Cochrane Library, EBSCO CINAHL, Scopus, and Ovid PsychINFO.

Keywords

Keyword searches will be conducted for the following key concepts:

Resilience: resilience + psychological, adaptation + psychological, burnout + psychological, burnout, psychological stress, mental toughness, mental strength, mental resilience, emotional fitness, hardiness, grit, resilient, resiliency, perseverance, resistance, strain, elasticity, mental health, psychological capital

Training: education, curriculum, self-evaluation programs, mentoring, program evaluation, teaching, training support, meditation, counseling, focus groups, program, intervention, workshop, industry, company, companies, organizations, occupational, mindfulness, business, training, wellness program, workplace health program, promotion, skill

Keywords

Keyword searches will be conducted for the following key concepts:

Workplace: workplace, workload, employment, leadership, administrative management, organizational and administration, health manpower, job satisfaction, personnel turnover, presenteeism, absenteeism, sick leave, employment, professional autonomy, professional mental competency, occupation, employer-based, worker, job, supervisor, boss, work environment, workforce, workforce conditions

Health, wellness and cardiovascular health: health, mental health, cardiorespiratory fitness, occupational health, physical fitness, cardiovascular system, cardiovascular diseases, heart, stroke, wellness, wellbeing, performance, employee performance, performance management, mental hygiene

Note: Keywords for resilience attitudinal/behavioral outcomes and resilience organizational outcomes are being refined.

Eligibility Criteria

Eligible studies will be randomized controlled trials, comparative studies, quasi-experimental studies and controlled before-after studies published in English assessing the efficacy of any program designed to develop or enhance resilience in working-age adults (18-64 years).

Exclusion Criteria

Studies conducted solely in retirees will be excluded. Studies that focus on burnout among physicians and nurses will be excluded. Rationale: To improve generalizability of findings to working-age adults (U.S. mean working age is 43 years).

Proposed Moderators

The systematic literature review will investigate any documented differences in outcomes by company size, industry sector, organizational climate (or culture), leadership commitment, employee attitudes, employee readiness to change and key demographic factors (age, gender, race/ethnicity).

APPENDIX D. SUMMARY OF INCLUDED STUDIES

(Highlighted rows indicate statistical significance.)

Study	Setting	Participants	Intervention Description	Theoretical Basis & Framework	Summary of Findings
Abbott (2009)	Industrial organization; Australia	53 sales managers (53 analyzed; 0% dropout); mean age 43 years; 13% female; ≈41% with high school or less	A 10-week Internet-based intervention designed to address seven aspects of resilience: emotional regulation, impulse control, optimism, causal analysis, empathy, self-efficacy, and reaching out (social support)	Cognitive behavioral therapy (CBT); Universal; Generalized Stress; Resiliency Directed	Intervention did not show significant improvements in depression, anxiety and quality-of-life measures at the end of the program. SMD: -0.21 (95% Confidence Interval [-0.90; 0.49])
Arnetz (2009)	Police force; Sweden	25 young police officers with one year of experience (18 analyzed; 28% dropout); 0% female	Initial education session, then 10 weeks x 2 hours group sessions focusing on relaxation and stress inoculation through imagery training	CBT + Stress Inoculation Training (SIT); Universal; Traumatic Stress; Resiliency Mediated	After 1 year, moderate positive effects on psychophysiological stress, but not statistically significant. SMD: 0.71 (95% Confidence Interval [-0.21; 1.63])
Bekki (2013)	University; United States	150 STEM doctoral students (133 analyzed; 11% dropout); mean age 27 years; 100% female; 70% Caucasian	An online curriculum lasting at least 5 hours over 2-week period focusing on problem-solving knowledge, coping efficacy, resilience, personal resources, and confidence to achieve STEM landmarks.	Multiple Theories; Targeted; Generalized Stress; Resiliency Directed	After 2 weeks, the program produced moderately positive and statistically significant outcomes in resilience, coping efficacy and problem-solving knowledge. Other outcomes were positive, but not statistically significant. SMD: 0.66 (95% Confidence Interval [0.31; 1.00])
Bradshaw (2007)	Hospital, United States	67 patients with a diagnosis of Type 2 diabetes (51 analyzed; 20% dropout); mean age 59 years; 50% female; 91% Caucasian	An online 10-module, 15-hour educational curriculum intended to develop resilience in people with Type 2 diabetes to develop self-directed behavior change.	CBT + Social Support (SS); Targeted; Generalized Stress; Resiliency Directed	After 6 weeks, study reports a “clear resiliency effect for psychosocial outcomes,” but no significant improvements in HbA1c or waist circumference. SMD not calculated due to lack of available data.
Cigrang (2000)	Military; United States	178 service members referred for a mental health evaluation; mean age 20 years; 37% female; 75% Caucasian	A 2 x 90-minute group-based curriculum provided education and practice in relaxation training, problem-solving and self-instruction skills.	SIT + Problem-Solving Model (PSM); Targeted; Generalized Stress; Neither Resiliency Directed nor Resiliency Mediated	After the intervention, overall low positive effect, which was not statistically significant SMD: 0.21 (95% Confidence Interval [-0.17; 0.41].)
Cohn (2007)	Military; Australia	Five army platoons comprising 174 soldiers; 18% female.	2 x 40-minute classroom style psychological intervention over 6 weeks focusing on cognitive restructuring and coping strategies	CBT + PSM; Universal; Generalized Stress; Neither Resiliency Directed nor Resiliency Mediated	After 23-days follow-up, very low positive treatment effect, which was not statistically significant SMD: 0.04 (95% Confidence Interval [-0.26; 0.34].)
Dolbier (2010)	University; United States	64 college students (38 analyzed; 41% dropout); mean age 21 years; 84% female; 42% Caucasian	Four weekly 2-hour group-based sessions of Transforming Lives Through Resilience Education curriculum that focused on transforming stress through coping, problem-focused and emotion-focused exercises	CBT + PSM; Universal; Generalized Stress; Resiliency Directed	After the end of the intervention, students showed large and statistically significant improvements in stress-related growth. SMD: 1.92 (95% Confidence Interval [0.28; 0.35].)
Farchi (2010)	City in Israel during active war and bombing; Israel	68 adult residents; approximately 70% female	2 phone calls 1 week apart that used psychological inoculation to challenge cognitive barriers that impede adaptive behavior	CBT + PSM; Targeted; Traumatic Stress; Resiliency Mediated	SMD not calculated due to lack of available data.
Gardner (2005)	Hospital; United Kingdom	138 employees of a National Health Service Community Trust (55 analyzed; 60% dropout); mean age 37 years; 82% female; 75% employed in the intellectual disabilities unit	3 x ½ day group-based workshops focusing on stress management either through coping strategies or cognitive behavioral techniques	CBT; Universal; Generalized Stress; Resiliency Mediated	After 3 months, intervention produced a small, positive but not statistically significant effect. SMD: 0.38 (95% Confidence Interval [-0.25; 1.01].)

Study	Setting	Participants	Intervention Description	Theoretical Basis & Framework	Summary of Findings
Grant (2009)	Public health agency undergoing change and restructuring, Australia	41 executives and senior nurse managers (32 analyzed; 22% dropout); no demographics reported.	A 360-degree review, a ½ day leadership workshop, and four individual coaching sessions over 10 weeks	CBT + TMS	After 3 months, intervention led to moderate, positive, but not statistically significant effect. SMD: 0.69 (95% Confidence Interval [-0.1; 1.46]).
Grime (2004)	Healthcare, United Kingdom	48 employees in an occupational health department (39 analyzed; 19% dropout) with recent stress-related absenteeism; mean age 39 years; 59% female	8-week computerized cognitive behavioral therapy program, "Beating The Blues"	CBT; Targeted; Generalized Stress; Resilience Mediated	After 6 months, program effect moderate, positive but not statistically significant. SMD: 0.56 (95% Confidence Interval [-0.08; 1.19]).
Hodges (2010)	Financial services, Southeastern U.S.	501 managers and associates (463 analyzed; 8% dropout); mean age 39 years; 74% female	3.5-hour classroom-based learning over 6 weeks focusing on components of psychological capital: efficacy, hope, optimism, and resilience)	Psychological Capital (PsyCap); Universal; Generalized Stress; Resilience Directed	After the intervention, the effect was low, positive but not statistically significant. SMD: 0.16 (95% Confidence Interval [-0.07; 0.39]).
Kanekar (2009)	University, Midwestern U.S.	60 Asian Indian international students attending graduate school (39 analyzed; 35% dropout); mean age 25; 13% female; 0% Caucasian	3 x educational modules completed over 2 months, and delivered via Blackboard; with email reminders	SS + Acceptance and Commitment Therapy (ACT); Targeted; Generalized Stress; Resilience Mediated	After two months, the effect was low, positive but not statistically significant. SMD: 0.06 (95% Confidence Interval [-0.57; 0.69]).
Kent (2011)	Military, U.S.	39 U.S. veterans with diagnosed Post Traumatic Stress Disorder symptoms (39 analyzed; 0% dropout)	12-week group-session psychoeducational curriculum	CBT; Targeted; Trauma; Resilience Mediated	After three months, the program effect was high, positive, but not statistically significant across all outcomes. Outcomes reported indicate that improvements in depression, anxiety, emotional and cognitive functioning. SMD: 1.13 (95% Confidence Interval [-3.67; 5.49]).
Litz (2007)	Military, U.S.	45 Department of Defense service members with diagnosed PTSD; mean age 39 years	8-week online program augmented with 2 hours of face-to-face interaction; total program length not reported	CBT; Targeted; Trauma; Resilience Mediated	After six months, the effect was moderate, positive but not statistically significant. SMD: 0.43 (95% Confidence Interval [-0.26; 1.11]).
Loprinzi (2011)	Healthcare, U.S.	24 breast cancer survivors (20 analyzed; 17% dropout); mean age 60 years; 100% female	2 x 90' group training session + 1 brief individual session + 3 follow-up telephone calls	Attention and Interpretation Theory (ACT); Targeted; Traumatic Stress; Resilience Directed	After 3 months, the program effect was close to zero and not statistically significant. SMD: -0.08 (95% Confidence Interval [-0.97; 0.82]).
Luthans (2008)	Diverse occupations recruited through university contacts, U.S.	364 diverse working adult volunteers; mean age 32 years; 89% Caucasian	2 x 45-min self-directed web-based sessions taken one week apart	PsyCap; Universal; Generalized Stress; Resilience Directed	After 1 month, the program effect was low, positive and not statistically significant. SMD: 0.1 (95% Confidence Interval [-0.11; 0.30]).
Luthans (2010)	University, U.S.	242 advanced management students; mean age 36 years; 46% female; 76% Caucasian	One 2-hour group training session with exercises and discussions based on psychological capital attributes	PsyCap; Universal; Generalized Stress; Resilience Directed	Shortly after intervention, the program effect was moderate, positive and statistically significant. SMD: 0.53 (95% Confidence Interval [0.30; 0.77]).
Maddi (1998)	Utility company, Midwest U.S.	54 managers (46 analyzed; 15% dropout); 40% female	10 x 1.5 hours group-based sessions separated by 2-week focusing on developing hardiness	Transactional Model of Stress (TMS); Universal; Generalized Stress; Resilience Mediated	SMD not calculated due to lack of available data.

Study	Setting	Participants	Intervention Description	Theoretical Basis & Framework	Summary of Findings
McGonagle (2014)	Diverse occupations, United States	59 working-age adults from university, health, insurance and pharmaceutical industries with any chronic condition (48 analyzed; 19% dropout); mean age 39 years; 86% female	Six 1-hour telephonic coaching sessions over 12 weeks	TMS + Conservation of Resources Theory (COR); Targeted; Generalized Stress; Resilience Directed	After 3 months, the program effect was moderate, positive and not statistically significant. SMD: 0.4 (95% Confidence Interval [-0.17; 0.96].
Pidgeon (2014)	Healthcare and social services, Australia	44 professionals working in human services (35 analyzed; 20% dropout); mean age 41 years; 91% female	2.5-day group-based meditation retreat	Mindfulness Based Therapy; Universal; Generalized Stress; Resilience Directed	After 4 months, the program effect was low, negative, but not statistically significant. SMD: -0.16 (95% Confidence Interval [-0.82; 0.51].
Rose (2013)	University, United States	66 college students (59 analyzed; 11% dropout); mean age 28 years; 50% female; 52% Caucasian	6 x 45 minute self-guided, multimedia education curriculum	CBT + SIT; Universal; Generalized Stress; Neither Resilience Directed nor Resilience Mediated	Immediately after the program, the effect was low to moderate, positive but not statistically significant. SMD: 0.39 (95% Confidence Interval [-0.13; 0.90].
Sahler (2013)	Mothers recruited in a medical setting, United States	309 mothers of children newly diagnosed with cancer (191 analyzed; 38% dropout); mean age is 37 years; 100% female; 61% Caucasian	Eight weekly 1-hour individual sessions	PSM; Targeted; Traumatic Stress; Neither Resilience Directed nor Resilience Mediated	After 3 months, the program effect was low, positive and statistically significant. SMD: 0.29 (95% Confidence Interval [0.05; 0.54].
Songprakun (2012)	Diverse patients recruited in a medical setting, Thailand	56 adults diagnosed with mild depression (53 analyzed; 5% dropout); mean age 42 years; 73% female; 0% Caucasian	8 x weekly self-help modules using bibliotherapy (self-help books)	CBT; Targeted; Generalized Stress; Neither Resilience Directed nor Resilience Mediated	After 1 month, the program effect was high, positive and statistically significant. SMD: 1.01 (95% Confidence Interval [0.44; 1.58].
Sood (2011)	Academic medical center, Midwest U.S.	40 physicians (32 analyzed; 20% dropout)	90' one-on-one training.	ACT; Universal; Generalized Stress; Resilience Directed;	After 2 months, the program effect was high, positive and statistically significant. SMD: 1.08 (95% Confidence Interval [0.08; 1.81].
Steinhardt (2008)	University, USA	64 college students (57 analyzed; 11% dropout); mean age 21 years; 82% female; 44% Caucasian	4-week x 2 hourly sessions.	Multiple; Universal; Generalized Stress; Resilience Directed	Immediately after the program, the effect was moderate, positive, but not statistically significant. SMD: 0.48 (95% Confidence Interval [-0.07; 0.99].
Varker (2012)	Emergency services, Australia	82 emergency services professionals (78 analyzed; 5% dropout); mean age 26 years; 56% female	40 minutes of group-based sessions comprising stress inoculation training	SIT; Targeted; Traumatic Stress; Resilience Mediated;	SMD not calculated due to lack of available data.
Waite & Richardson (2004)	Government, United States	232 government employees (150 analyzed; 35% dropout); 50% female	5 x 8-hr skills training modules with follow-up review sessions lasting 1-2 hours	Skills-building; Universal; Generalized Stress; Resilience Directed	At < 3 months, the effect was almost zero, positive and not statistically significant. SMD: 0.09 (95% Confidence Interval [-0.24; 0.42].

Key:

CBT = Cognitive Behavioral Therapy

SMD = Standardized Mean Difference

SIT = Stress Inoculation Therapy

SS = Social Support

PSM = Problem Solving Model

PsyCap = Psychological Capital Model

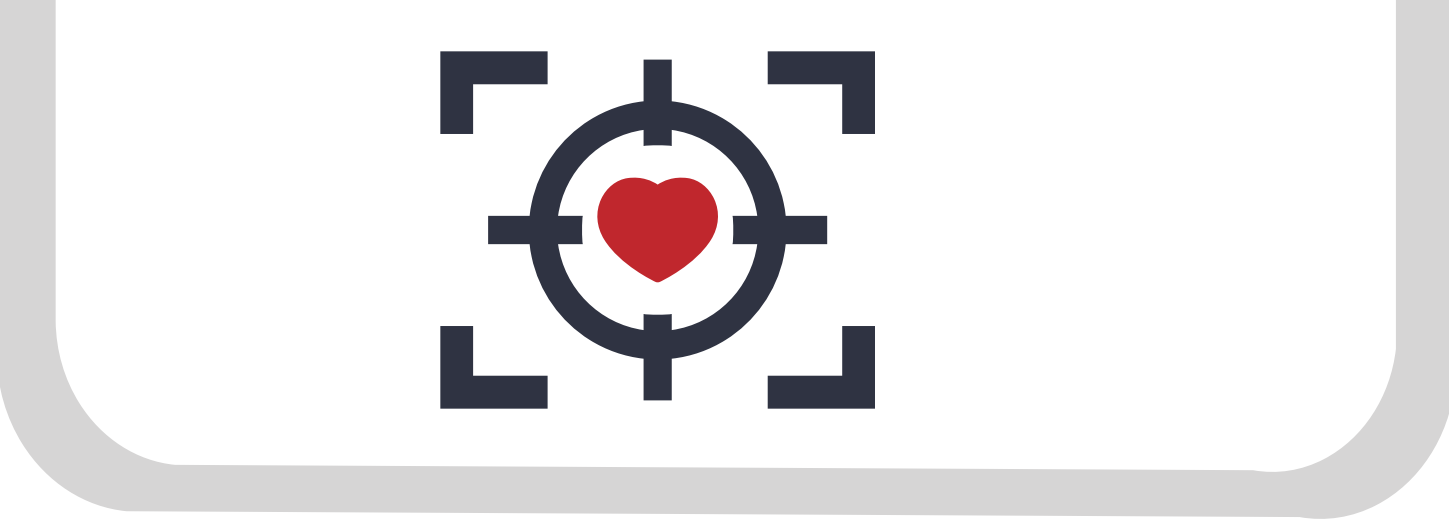
ACT = Acceptance and Commitment Therapy

TMS = Transactional Model of Stress




COR = Conservation of Resources Theory

Universal = All employees eligible for program (Primary Prevention)**Targeted** = Program offered to employees assessed to be at risk (Secondary Prevention)**Resilience Directed** = Study defined resilience and measured it**Resilience Mediated** = Study did not measure resilience directly

APPENDIX E. THEORETICAL APPROACHES, DEFINITIONS and APPLIED EXAMPLES

Theory & Definition	Applied Example
 <p>Attention and Interpretation Therapy (AIT)</p> <p>Focuses on guiding learners to delay judgment and pay greater attention to the novelty of the world rather than the contents of the mind.³⁵</p>	<p>Loprinzi 2011:²⁶ The Stress Management and Resiliency Training (SMART) program consists of two small-group, 90-minute sessions, a brief individual session with a study investigator and three follow-up telephone calls made by the investigator.</p> <ul style="list-style-type: none"> • Exercises are included to help patients direct their interpretations away from fixed prejudices and toward a more flexible disposition while cultivating skills such as gratitude, compassion, acceptance, forgiveness and higher meaning and purpose. • Follow-up calls served to remind participants to practice skills taught through the exercises and to answer any participant questions.
 <p>Cognitive Behavioral Theory (CBT)</p> <p>Focuses on modifying dysfunctional thinking processes by learning to discriminate between distorted thoughts and reality.⁸⁶</p>	<p>Rose 2013:³² Stress Management and Resilience Training for Optimal Performance (SMART-OP) is a resilience training program originally developed for NASA. It is a self-guided, multimedia, CBT-based stress management and resilience training program.</p> <ul style="list-style-type: none"> • Thought activities teach the user cognitive flexibility and a structured approach to realistic/logical thinking with personally relevant stress content. Activities include compartmentalization and weighting evidence. • Action activities teach the user to take effective actions to manage stress in their lives, including: effective communication, strategic problem-solving, resilience through writing. • Users are encouraged to practice and apply these skills through homework assignments.
 <p>Conservation of Resources Theory (COR)</p> <p>Maintains that individuals strive to retain, protect and build resources and that a threat or actual loss of resources produces stress and strain outcomes; individuals can draw on available resources to prevent further resource loss.¹¹¹</p>	<p>McGonagle 2014:³⁰ The intervention is a 12-week, six-session, phone-based coaching program designed to help workers with chronic illness manage challenges.</p> <ul style="list-style-type: none"> • A key component of the program is coaching, a nonclinical, future-oriented strategy to help individuals grow, adapt and change behaviors, aimed to boost workers' levels of internal resources to manage stress. • Coaching content included working with clients to identify needs and establish goals, and apply techniques such as “powerful questioning” to help the client increase awareness and see the situation from a fresh perspective, “options” to give the client alternatives, and “way forward” to help the client define and develop action plans. Homework and client reflection are also incorporated.

Theory & Definition	Applied Example
<div data-bbox="345 499 810 665" style="text-align: center;">  </div> <p data-bbox="410 694 766 779" style="text-align: center;">Mindfulness-based therapy (MBT)</p> <p data-bbox="336 816 864 945">Focuses on developing accurate perception and presence (being in the "here and now.")¹¹²</p>	<p data-bbox="974 631 1884 759">Pidgeon 2014:³¹ The Mindfulness with Metta Training Program targets the enhancement of mindfulness and self-compassion in a retreat format and targets human services professionals.</p> <ul data-bbox="991 788 1913 965" style="list-style-type: none"> • The 2.5-day retreat-style program consists of periods of silence and training in mindfulness and meta skills, and cognitive therapy strategies to increase mindfulness and self-compassion.
<div data-bbox="355 1179 821 1345" style="text-align: center;">  </div> <p data-bbox="423 1373 733 1459" style="text-align: center;">Problem-Solving Model (PSM)</p> <p data-bbox="310 1530 869 1659">Includes active learning centered on the investigation and resolution of real-work problems.⁸⁷</p>	<p data-bbox="974 1236 1913 1459">Cigrang 2000:¹⁵ Two 90-minute classes focused on coping efforts in basic training, designed to allow interaction among participants and opportunities for interpersonal learning. It targeted military trainees referred for a psychological evaluation from Air Force basic training and recommended for return to duty.</p> <ul data-bbox="991 1493 1902 2007" style="list-style-type: none"> • A problem-solving approach was integrated by having the class identify potential coping responses to real training situations faced by participants. They then discussed potential consequences of the responses and were asked to choose the best alternative. • Non-referred trainees were included in the classes to serve as positive role models and sources of helpful information for referred trainees. • Participants were also provided education and practice in relaxation training and self-instruction skills consistent with stress inoculation therapy.
<div data-bbox="355 2079 821 2244" style="text-align: center;">  </div> <p data-bbox="406 2273 777 2359" style="text-align: center;">Psycho-educational Approach (PE)</p> <p data-bbox="310 2416 886 2587">Increases personal knowledge about the causes and contributors to stress and the cognitive, emotional, behavioral and physiological effects of stress.¹¹³</p>	<p data-bbox="974 2102 1913 2230">Steinhardt 2008:³⁶ Transforming Lives Through Resilience Education is a universal, trauma-focused four-hour classroom intervention (also available online).</p> <ul data-bbox="991 2259 1902 2630" style="list-style-type: none"> • Psychoeducation increases personal knowledge about the causes of and contributors to stress and the cognitive, emotional, behavioral and physiological effects of stress. • Participants are taught to identify and address negative thoughts (i.e., learning to perceive a challenge rather than a threat); practice behaviors that mitigate stress; and learn about the types, causes and effects of stress. All these skills enable individuals to better manage stress.

Theory & Definition	Applied Example
 <p>Psychological Capital (PsyCap)</p> <p>Involves building four capacities described as independent and malleable to change: resilience, self-efficacy, optimism and hope.²⁸</p>	<p>Luthans 2010:²⁸ This online workplace health program included two 45-minute sessions that target building resilience, self-efficacy, optimism and hope.</p> <ul style="list-style-type: none"> • Sessions focus on goals and pathways, obstacle planning, building efficacy/confidence, developing positive expectancy, building assets/avoiding risks and influencing the process. • Video presentations invite participants to consider examples of resilience and efficacy in dramatized settings. Participants were also asked to consider and develop courses of action for real workplace situations.
 <p>Skills-Building Approach (SK)</p> <p>Incorporates learning and application of critical thinking and problem-solving skills that are exercised and strengthened through practice.</p>	<p>Waite & Richardson 2004:³⁸ This Personal Resilience and Resilient Relationships (PRRR) program is a biopsychospiritual enrichment program delivered over five weeks aimed to improve mental and spiritual health.</p> <ul style="list-style-type: none"> • Participants learn skills in recognizing and using resilience to be able to increase energy and focus energy in performing job functions. Interpersonal skills that move unit relationships from destructive to constructive are also targeted. • Key to this program are booster sessions that help to reinforce the skills learned.
 <p>Social Support Theory (SS)</p> <p>Incorporates how networking helps people cope with stressful events.¹¹⁴</p>	<p>Kanekar 2009:²³ The online intervention involved three sessions completed over 2 months targeted to support Asian Indian students at a U.S. university.</p> <ul style="list-style-type: none"> • Program addresses the benefits of social support and the relationship between social support and mental health, and includes activities to identify and build social support around participants. • Participants also learn about hardiness and acculturation and practice activities to increase commitment and control, and challenge and learn ways to increase acculturation in the American culture.

Theory & Definition

Applied Example

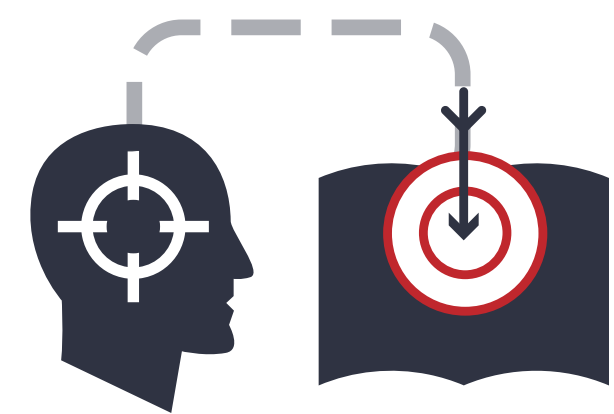


Stress Inoculation Theory (SIT)

Exposes individuals to forms of stress in a controlled process to education and helps participants build skills to address stress and avoid the negative outcomes of stress.⁸⁸

Varker 2012:³⁷ A 40-minute session based on SIT was incorporated into training for emergency personnel.

- Sessions focused on increasing a sense of controllability, reducing unexpectedness and desensitizing the person to likely stressful events.
- Skill-building topics included: education about physical responses to trauma; applied tension techniques; stopping techniques for inappropriate thoughts; importance of social support; education about appropriate and non-appropriate drug and alcohol use.



Transactional Model of Stress (TSM)

Under this model, an individual can be led to appraise a stressful situation as a manageable challenge.⁶³

Gardner 2005:¹⁹ This stress management program is a half-day workshop followed by four individual coaching sessions targeted to health care professionals.

- Participants received didactic teaching about stress and burnout, and the physical and mental signs of stress. They were helped to identify early warning signs and make personal goals.
- Participants also learned to challenge negative automatic thoughts using positive self-talk, and distraction and relaxation using imagery.

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Note:

*28 randomized control trial studies used in literature synthesis;

¥4 systematic reviews